AMERICAN NURSERYMAN

The Nurseryman's Forte: To Make America More Beautiful and Fruitful

NOVEMBER 1, 1937

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Lonicera Maackii Podocarpa

Text Published of Tax Ruling
Proper Methods of Packing
Chemicals Cause Foliage Colors
Try Hormones on Trees

AMERICAN NURSERYMAN

Chief Exponent of the Nursery Trade

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ANOTHER GOOD SEASON.

Autumn sales for most nurserymen have shown as marked an advance over last year as spring business did six months ago. Landscape firms were well pleased in September, though there was a slowing down in orders in October. The latter may have been due in part to the stock market decline and the consequent tightening of purses, but more likely it was due to the cessation of building activity which was on the way to a boom when halted by the advance of prices. In recent weeks quotations on building materials have declined considerably, and the experience of the building trades this season is likely to lead to more cautious tactics next year. So there is general anticipation of real building activity in the spring of 1938.

Should that transpire, another good season is in prospect for nurserymen, as general business conditions are holding up well, the public purse again is open to purchases for home planting, farmers have funds for orchards and windbreaks, and higher industrial wage scales make possible further expenditure.

PACK RIGHT.

Shipments of nursery stock bring quite different reactions to the recipients. Some shipments are so perfectly packed they create a feeling of real satisfaction. Others betray ignorance or carelessness. Not always is this because the stock is not protected well, but rather because protection is given at unnecessary expense to the buyers. Not only should the nurseryman have full knowledge of how to pack his stock so as to reach the recipient in the best condition, but he should also be so familiar with transportation rates as to be able to send the stock fully protected at least cost.

Some shippers received an eye opener at the convention of the California Association of Nurserymen when examples of shipments, some packed right and some wrong, were exhibited as part of the report of the transportation committee. Some photographs of those examples and the comments relating to them are reproduced on another page of this issue. They will be an eye opener to many readers in other states, as they were to some California nurserymen.

TRADE NUMBERS.

Estimates of the number of nurserymen in England seem to be as various as figures on the trade in this country, for a trade periodical abroad, the Horticultural Advertiser, refers to one figure of 10,000 and another of 6,000, but doubts if there are more than 2,000 or 3,000 bona fide nurserymen in England, excluding "jobbing gardeners, small holders and market gardeners fond of using the title."

Figures are as various in this country, depending on the manner of their compilation. Probably the federal horticultural census figure of approximately 7,000 in 1929 was as near accurate as any.

Many persons are misled by the state lists of licensed nurseries. In some states these lists indicate the acreage, and if it is only one-tenth or one-quarter, one is fairly sure that the operator is a back-yard gardener, not a nurseryman. Unfortunately, not many states list the acreage. It would be much better if all would do so and, furthermore, indicate whether the person who receives the license derives his livelihood from the plants he grows and sells, or whether it is a hobby or side line.

More accuracy as to definitions would make possible greater definiteness as to trade figures.

HYBRIDS of nut trees which make remarkable timber growth are seldom prolific in bearing and vice versa.

The Mirror of the Trade

LONICERA MAACKII PODOCARPA.

Despite early hard freezes that defoliated many shrubs, Lonicera Maackii podocarpa is still beautifully cloaked in its dark green leaves and decorated with its bright red translucent berries, which usually appear in pairs at the nodes along the branches. The habit of this honeysuckle to hold its foliage and fruit late into the fall, usually well into November, makes it especially useful. Furthermore, it is one of the showiest honeysuckles when in flower, the large white blooms, which yellow with age, appearing in June, making this the latest of the bushy loniceras to flower. It is, thus, equally useful in extending the blooming season in the shrub border.

The branches have a graceful spreading habit somewhat suggestive of some of the forsythias. Though this lonicera may reach ten to twelve feet in height and occasionally more, it is commonly seen no more than eight feet at maturity. The leaves grow to over three inches and are oval or elliptic and sharply pointed. Their color is darker green than in the type. This honeysuckle is extremely hardy, so that it should give little trouble on that score except in the northernmost sections of the country. Propagation is easily accomplished by means of either hardwood or softwood cuttings.

Although the species, L. Maackii, is usually called in common parlance the Amur honeysuckle, variety podocarpa is generally referred to as the late honeysuckle, from its late-flowering and fruiting habits. A good specimen on display at this season is certain to attract attention, as the sweeping dark green branches seem studded with rubies.

FOR many years one of the well known species of the extensive pine family has been referred to by one of two common names—Norway or red pine. As it is really a native of this country, growing in the northeastern and lake states, the forest service, according to the press service of the United States Department of Agriculture, will henceforth refer to it as red pine.

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VOL. LXVI NOVEMBER 1, 1937 No. 9

Text Published of Tax Ruling

Official Organ of Internal Revenue Bulletin Presents Ruling Exempting Nursery Employees from Social Security Tax as Agricultural Labor

Announcement of the reversal by the internal revenue bureau of its ruling in respect to nursery employees as agricultural labor under the social security act, reported in the October 15 issue of the American Nurseryman, was followed shortly thereafter by the publication of the text of the decision in the official Internal Revenue Bulletin for October 18. This ruling, designated as S.S.T. 203, is especially interesting since it establishes the interpretation of agricultural labor, not merely by the dictionary and the proposed intent of the lawmakers, but in the light of a half-dozen important judicial decisions involving nursery employees. The process of reasoning by which the earlier decision was reached, adverse to nursery labor, was told in the October 15 issue.

In a letter in which interested parties were informed of the new ruling, containing six typewritten pages from the acting commissioner of internal revenue at Washington, reference was made in the opening paragraph to the conference in that office August 12, 1937, at which representatives of the American Association of Nurserymen were present. Later mention was made of the motion pictures shown at that time as evidence of the agricultural character of nursery operations. Further information submitted in the form of judicial decisions established the fact that nursery employees had generally been held as agricultural laborers and so excluded from the operation of state compensation laws. The new ruling contains reference to a half-dozen decisions of this character, while the adverse ruling previously rendered reported only one, and that had reference to commercial greenhouses.

When the internal revenue bureau had prepared its opinion that nursery employees were entitled to exemption from the operation of the social security act as agricultural labor, and members of Congress were informed of this matter, there was immediate request for application of the ruling to commercial flower growers whose operations are conducted on a farm. Admittedly, this would not include greenhouse operators, but rather growers of such crops as dahlias, gladioli, peonies and other flower and bulb crops produced under field conditions. In consequence, the new ruling has been applied to revoke not only S.S.T. 73, applied to nurserymen, but also S.S.T. 72, applied to commercial flower growers.

In the concluding paragraph of the new opinion, the internal revenue bureau has attacked the problem of dividing nursery employees entitled to the exemption as agricultural labor from those who are not. This, says the ruling, depends upon the type of work the employee performs, and from the application of the exemption are eliminated "employees such as office workers or individuals employed in a retail or wholesale establishment, who are concerned merely with the sale or disposal of the nursery stock or flowers and who do not perform services in connection with the growing thereof."

Some nurserymen raise the question whether this last provision is not in conflict with article 206 (1) (c) of regulations 90, which states that agricultural labor includes all services performed by an employee "in connection with the processing of articles from materials which were produced on a farm; also the packing, packaging, transportation or marketing of those materials or articles." What is the definition of "marketing" in one regulation and the definition of "sale

A. A. N. THANKS.

It is impossible for the nurserymen of the United States to give enough credit to the men who have worked so hard to bring about the ruling classifying nursery labor as agricultural, which will be of untold benefit to the nursery business. In thanking the contact committee of this year, composed of Clarence O. Siebenthaler, Paul Stark and Lee McClain, we do not want to overlook those members who gave so untiringly of their time last year; namely, Lester C. Lovett, Henry B. Chase, Owen G. Wood and A. F. Watkins. All of these men have made numerous trips to Washington, working on this matter, and we would indeed be ungrateful if we did not express our appreciation to each one of them.

We are also grateful to the various senators and congressmen who showed such a fine spirit of coöperation and a clear understanding of our problems. Senators Clark, of Missouri, and Connally, of Texas, and Congressmen August Andresen, of Minnesota, and Morgan C. Sanders, of Texas, were especially helpful to the committee.

Throughout all of the hearings, the committee relied on the sane judgment of our good friend and attorney, M. Q. McDonald, and his sane logic and experience were of untold benefit to the committee.

I feel that the committee has done a wonderful piece of work and want to thank everyone who has helped in any way to bring about the favorable ruling. It is impossible to mention all of those who have participated in this work, but this does not mean that their efforts are valued any the less.

E. L. Baker, Pres.

or disposal of nursery stock" in the other?

So much is clear thus far that nurserymen who have paid the social security tax on field and packing house labor would be entitled to a refund, and proper forms may be obtained from the internal revenue office where payment was made.

While letters have been received by organization representatives interested in obtaining the new ruling, the official wording is that contained in the issue of the Internal Revenue Bulletin for October 18, 1937, volume 16, number 42, pages 26 to 29. Because of the interest of every nurseryman in this ruling, designated as S.S.T. 203, and also in the judicial arguments on which it rests, the text is published here in full, as follows:

Services performed by an employee on a farm of which the employer is owner or tenant in the growing of nursery stock constitute "agricultural labor" for the purpose of titles 8 and 9 of the social security act.

Services performed by an employee on a farm of which the employer is owner or tenant in the growing of flowers constitute "agricultural labor" for the purpose of titles 8 and 9 of the social security act.

The question is presented whether services performed by employees of nurserymen and commercial flower growers constitute "agricultural labor" within the meaning of sections 811(b)1, title 8, and 907(c)1, title 9, of the social security act. Sections 811(b)1 and 907(c)1 of that act provide as follows:

The term "employment" means any service, of whatever nature, performed within the United States by an employee for his employer, except

(1) Agricultural labor.

In S.S.T. 72 it was held that services performed by employees of commercial flower growers do not constitute "agricultural labor" within the meaning of section 907(c)1 of the social security act. It was further held in S.S.T. 73 that services performed by employees of nurserymen do not constitute "agricultural labor" within the meaning of that section. These conclusions under title 9 of the act were also made applicable under title 8 in view of the provisions of section 811(b)1. In those rulings the term "agricultural labor" was given a narrow construction based upon the authorities and reasoning contained therein. Additional information has now been submitted and reconsideration of the prior rulings has been asked in the light of such information and a number of court decisions pertinent to the issue.

Considering first the question as to employees of nurserymen, in Davis v. Industrial Commission of Utah, 206 Pac. 267, the court discussed the meaning of the words "agricultural laborers" as used in section 3110 of the Utah industrial act. The court stated:

Doubtless the legislature used the words "agricultural laborers" in their plain, usual, and commonly accepted sense and as defined by lexicographers. There is no reason for believing that it was intended that the words should be given the most narrow definition of which they are susceptible.

The court in that case cited with approval a definition of "agriculture" found in 2 C.J., page 988, reading as follows:

The term "agriculture" has been defined to be the "art or science of cultivating the ground, especially in fields or large quantities, including the preparation of the soil, the planting of seeds, the raising and harvesting of crops, and the rearing, feeding, and management of live stock, tillage, husbandry and farming." In its general sense the word also includes gardening or horticulture.

That definition has also been quoted with approval in Koger v. A. T. Woods, Inc., 31 Pac., 2d, 255; Dorrell v. Norida Land & Timber Co., et al., 27 Pac., 2d, 960, and many other cases.

In Bucher v. American Fruit Growers' Co., 163 Atl. 33, the court held that a fruit grower's employee was engaged in "agriculture" within the meaning of the state compensation act. The court quoted with approval the following excerpt from the opinion of the court below:

It is contended by the claimant that fruit growing is horticulture, an occupation distinct from agriculture and not included therein. But the dictionary definition of horticulture is "the department of science of agriculture which relates to the cultivation of gardens or orchards, including the care of vegetables, fruit, flowers and ornamental shrubs and trees." In common parlance it is unquestioned that agriculture would be considered as including fruit growing. If it is correct that horticulture is one department of agriculture, then agriculture must include horticulture. (See, also, 2 Corpus Juris, 988). The occupations of growing fruit and of raising other crops are so allied to each other and the character and condition of labor required so identical in each case that we can see every reason why a laborer in fruit growing should be treated and classified in the same way under this act of assembly as a laborer on a farm which grew crops other than fruit.

In Hill v. Georgia Casualty Co., 45 S.W. 2, 566, the court held that a nursery laborer was an "agricultural laborer" and was excluded from the operation of the state compensation law. The court stated in part as follows:

That one engaged in the nursery business is engaged in an agricultural pursuit is not to be doubted. In Webster's Dictionary a "nursery" is defined to be "a place where trees, shrubs, vines, etc., are propagated for transplanting or as use for stocks for grafting; a plantation of young trees or other plants." A "nurseryman" is defined by the same authority to be "one who conducts or cultivates a nursery for young trees, shrubs," etc. The specific branch of agriculture to which the nursery industry belongs is denominated "horticulture," which term is defined by Webster as follows: "The cultivation of a garden or orchard; the science or art of growing fruits, vegetables, and flowers or ornamental plants. Horticulture is a branch of plant production, which is one of the main divisions of agriculture."

It is a matter of common knowledge that the general character of work done in nursery operations is not materially different from work done in other agricultural operations.

The Supreme Court of Tennessee in Ginn v. Forest Nursery Co., 52 S.W. (2d), 141, concluded that a nursery employee should be classified as a "farm or agricultural laborer" within the meaning of section 6 of the workmen's compensation law. The court stated in part as follows:

The employment of the plaintiff in error in the case before us required him to till the soil, to tend growing plants, shrubs and young trees, to prepare them for market, and to deliver them to a shipping point. The harvesting and marketing of grain, the transplanting and care of tobacco plants, and the delivery of a bale of cotton from farm to shipping point, are all ordinary incidents of farm labor. The work and labor performed by plaintiff in error differed from that of the ordinary farmer only in the kind and nature of the products of the soil grown and prepared for market. No difference in hours of labor, hazard, or remuneration is pointed out which might induce a legislature to include the one and exclude the other from the operation of the statute. The labor performed by plaintiff in error and contemplated by his employment was agricultural in the literal sense and meaning of the word, and we think we would not be justified in holding that he was not a "farm or agricultural laborer."

There is authority for giving the word "agriculture" a restricted and narrow meaning. See, for example, the article on horticulture in 11 Encyclopedia Britannica, page 774, in which it is stated as follows:

Admittedly horticulture deals with crop production, and therefore has a close relationship to agriculture, but yet there is a distinction which is officially recognised in many acts of Parliament. In some acts the term agriculture is defined specially as including horticulture, but where no such definition is made horticulture often has been deemed to be excluded.

The question is then whether the term "agricultural labor" as used in the taxing provisions of the social security act should be given a broader construction than was given in S.S.T. 72 and S.S.T. 73, supra. The legislative history of the term is not particularly enlightening. However, the report of the Senate committee on finance (No. 628, page 45) indicates that "agricultural labor" was excepted from the taxes imposed by the social security act because of "the difficulties in collecting the tax." Such difficulties arise in part from the transient and migratory nature of the labor. Taking such report into consideration, it would seem that if the difficulty in collecting the social security taxes is present in the agricultural field in its broader sense, then the words "agricultural labor" as used in the social security act should be given a corresponding interpretation.

It is stated that in general nurserymen (as well as flower growers) use the same type of labor as that used by the ordinary farmer who is engaged in growing food products, and that no special skill is needed by such labor, which is just as transient and migratory as the ordinary farm labor. It further appears that such labor is not only of the same type, but that it also performs the same duties in cultivating nursery stock and flowers as it would perform in cultivating food products on an ordinary farm.

Upon reconsideration of the issue in the light of the further information submitted, it is that the term "agricultural labor" should be given a broader construction than that contained in S.S.T. 72 and S.S.T. 73, supra, and that services performed by an employee on a farm of which the employer is the owner or tenant in the growing of nursery stock constitute "agricultural labor" within the meaning of sections 811(b)1 and 907(c)1 of the social security act. In view of this conclusion, S.S.T. 73, supra, is revoked.

In conformity with the above conclusion with respect to employees of nurserymen, it is held that services performed by an employee on a farm of which the employer is owner or tenant in the growing of flowers constitute "agricultural labor" within the meaning of that term as used in the taxing provisions of the social security act. Accordingly, S.S.T. 72, supra, is revoked.

It should be noted, however, that not every individual employed by a nurseryman or commercial flower grower is entitled to be classed as an agricultural laborer. (See article 206(1) of regulations 90, and article 6 of regulations 91.) Pursuant to the regulations, the exemption depends upon the type of work the employee performs. In general, services performed by employees on a farm which is owned or tenanted by the employer in connection with the planting, cultivating, harvesting and preparing for market of the products of the soil, and in doing incidental tasks connected therewith, constitute "agricultural labor," while services performed by employees, such as office workers or individuals employed in a retail or wholesale establishment, who are concerned merely with the sale or disposal of the nursery stock or flowers and who do not perform services in connection with the growing thereof do not constitute "agricultural labor" within the meaning of that term as used in the taxing provisions of the social security act.

Proper Methods of Packing

Examples of the Right and the Wrong Way to Pack Nursery Stock as Presented at California Convention

One of the most interesting features of the recent convention of California Association of Nurserymen at Oakland was the report of the transportation committee. This committee, composed of W. A. Shunk, Toichi Domoto and H. A. Marks, besides presenting a written report, made up individual samples of the right and wrong way to pack nursery stock, with such small details as proper labels on the stock being included in the exhibit.

With the right and wrong way of packing nursery stock for shipment by freight as its theme, the report stated that every commodity is listed in what is known as the consolidated freight classification, which covers western, southern and Illinois classifications. Pacific coast nurserymen need only to interest themselves in the column headed "Western."

Classifications and tariffs are not to be confused. Classification is the class rate applied to each commodity, whereas tariff is the actual rate in dollars and cents as applied to each class rate. The consolidated classification book comes out in revised and complete form annually, and supplements are issued at intervals during the year.

Too much stress cannot be put upon the importance of the classification or the billing of nursery stock, or any other classification, inasmuch as the rate applicable to the commodity is directly dependent, in most cases, upon the method of packing or the type of container in which the commodity is shipped. Since there is a decided variance in rates, it is, therefore, advisable for the shipper to be familiar with the style of packing which will take the lowest possible freight rate.

The following, which covers all types of nursery stock, is taken directly from the current classification book and may be used as a guide when shipping. It is understood, of course, that the classifications which are given are subject to change at any time.

Note 1. "The term nursery stock applies to trees, shrubs and vines grown in the field and will not apply on florists' stock or potted or tubbed plants." From this it may readily be seen that it is advisable to remove all plants from pots so that they may be classified as field-grown nursery stock. Tubbed plants, which are classed under nursery stock, are discussed later.

"Cuttings, scions or seedlings, packed in barrels or boxes, take the third-class rate.

"Strawberry plants packed in baskets without overtop handles with solid or slatted cover take the double first-class rate. When packed in barrels, boxes or crates they take the first-class rate.

"Trees, shrubs or vines, roots balled in earth as dug from the nursery, balled, completely burlapped and securely sewed or tied, or in boxes or crates, take the third-class rate.

"Trees, shrubs or vines not otherwise indexed by name, other than balled in earth, roots in tubs or boxes, tops protected by crating, take double first-class rate. In bundles, tops tied, roots boxed or wrapped, they take the first-class rate. In bales or bundles, completely wrapped, they take the second-class rate. In barrels, boxes or crates or fiber board boxes, they will be accepted at third-class rate."

The use of fiber board boxes is not recommended except to those familiar with the weights allowable for boxes of specified strength as per rule No. 41. Most nursery stock is packed either in wooden boxes or wooden crates.

Probably a familiar sight to many is the tent-shaped crate, example 1 in the illustration on this page, which is often used. Referring to the classification, "Trees, shrubs or vines, other than balled, roots in tubs or

Methods of Correct and Incorrect Packing to Reduce Transportation Charges.

Example 1. Tent shape (Wrong).
Takes higher classification for freight than fully crated. Can be used in express shipment, but not recommended.
Example 2. Boxed (Right).
Correct for long-distance shipments. Evergreens, deciduous stock and conifers. Brace roots or balls securely.

Examples 3 and 4. Fully crated (Right).
Roots wrapped in burlap and securely braced. Should be further protected with heavy kraft paper or burlap before nailing slats on sides and top.
Tender material should be wrapped individually and then covered (Ex. 3). This is also method for shipping florists' stock in pots by express. Rail shipments take a higher rate when plants are in pots or tubs or boxes.

boxes, tops protected by crating," it is observed this type of packing carries a double first-class rate. Further, under the same heading comes the notation, "In barrels, boxes or crates," which carries the third-class rate, applied to example 2 in the first illustration. Now, on a supposed shipment of 100 pounds to New York city, double the first-class rate of $5.55, which would be $11.10, as against the charge of $3.98 if the plant had been properly crated so as to take the third-class rate, and it is easily understood why customers complain if such a mistake is made in packing methods.

Under the same heading is listed, "In bundles, r o o t s b o x e d or wrapped," first-class, and further, "In bales or bundles completely wrapped," second-class rate. It is therefore apparent that deciduous stock, such as fruit trees, should always be completely wrapped. Comparison appears in examples 7 and 8 in the illustration appearing on this page. Whether the material be paper, burlap or tule is immaterial. The important thing is that the wrapping completely cover the trees or vines. This same deciduous stock might also be crated and thus take a third-class rate instead of a second-class rate. However, the difference between the two rates is not great enough to compensate for the additional weight of a crate or box.

A good, simple plan to follow is to crate completely, so that all material in balls or cans or tubs is crated entirely and all bare root trees or vines are completely wrapped.

Another important item to watch is to avoid the building of a crate over the top of a boxed tree. The crate must completely cover the box; otherwise a double first-class rate will apply. Comparison is shown in examples 5 and 6 in the illustration below.

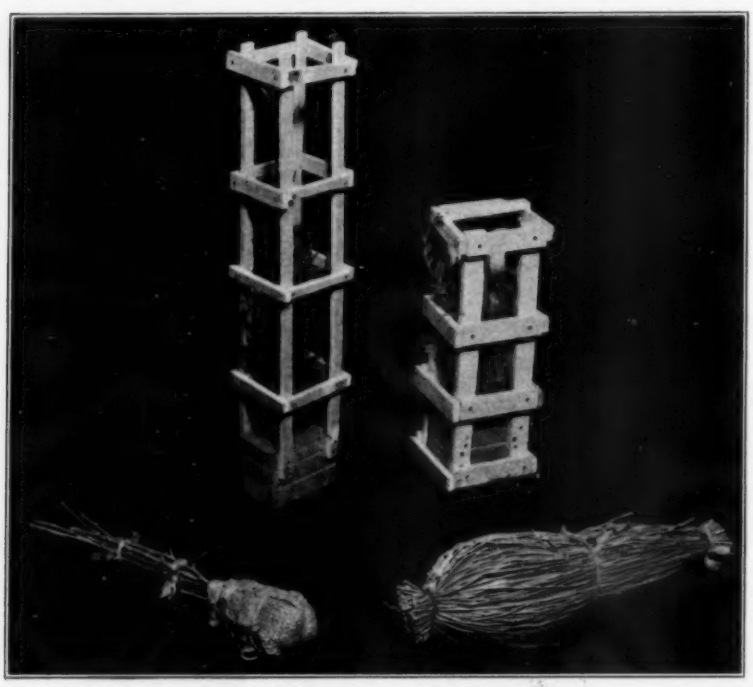
It is always perfectly safe to pack any material in wooden boxes, as this takes the very lowest rate possible. However, on account of the additional weight of packing this way, it is sometimes cheaper to crate plants than to box them.

The following is taken from rule 40 of the classifications covering crates: "Crates must be made of wood, protecting contents on the sides, ends, tops and bottoms and so constructed that freight may be taken in or out of a car or vessel within crate. Contents must be securely held within the crate and no part shall protrude. Surfaces liable to damage must be fully protected. Boxes must be made with solid or closely fitting sides, ends, tops and bottoms securely fastened." Examples 3 and 4, in the illustration on the preceding page, show correct methods.

Oftentimes it happens that an order will consist of several plants in, say, 5-gallon cans, perhaps a gallon can or two and some deciduous trees. The way to pack this would be to pack the 5-gallon cans and the gallon cans in one crate. The deciduous trees could then be packed in a separate bundle, completely wrapped. Suppose the crate holding the cans weighs over 100 pounds; then the small package of deciduous trees, although it would take the second-class rate, would only be charged for at its actual weight. If the shipment of two or more pieces, each carrying a different class rate, weighs less than 100 pounds, then it would take the highest rate to which one piece is subject.

If it is possible to cut the deciduous trees back to fit in the crate with the other material, it is advisable to do so, but most ornamental deciduous trees cannot be cut back so severely.

In shipping peat moss by the bale it should be billed out as "machine pressed bales." This takes a third-class rate. Peat moss billed as bags or bales takes the first-class rate.



Right and Wrong Ways to Pack for Shipment.

Example 5. (Wrong).
Plant in box with crate nailed to box. Note upright supports and side slats do not cover the entire box. This method takes double first-class rating.

Example 6. (Right).
Boxed plant completely crated. Uprights extended to bottom of box and side pieces all around, including bottom. This should be further protected with burlap or heavy paper before the side pieces are nailed into place. This method takes third-class rating.

Example 7. (Wrong).
Only the roots are protected in this method. Tops exposed. Takes a higher rating than Example 8, which has entire plant covered and wrapped.

Example 8. (Right).
Correct method of wrapping deciduous stock and vines. Tops protected by burlap, paper tule or other suitable material. Roots protected with moss, shingle tow or other material to prevent drying. Takes a lower rate than Example 7.

KALMIOPSIS LEACHIANA.

Kalmiopsis leachiana, the little Oregon shrub which took the rare plant trophy at the Laurelhurst show in Portland last year and which was given an award of merit in England this year, is becoming available in nurseries. Allied to the rhododendrons and kalmias, it is a dwarf, evergreen shrub, which is covered in spring with pink flowers. It was discovered in the mountains of southwestern Oregon by Mrs. John R. Leach, a botanist of Portland, Ore. Mrs. Leach found it growing in sun and in shade, among other plants and also in rocky crevices on bare mountain ridges. The height, about six inches, suggests its use in rock gardens.

Chemicals Cause Foliage Colors

Factors Involving Autumn Changes and Other Foliage Variations Subject of Radio Talk by Dr. A. B. Stout, New York Botanical Garden

In the plant kingdom, colors involve chiefly the presence and action of a few basic pigments, which are manufactured by the plant itself. The many intergrading differences seen in the colors of foliage involve various distributions and combinations of two or more pigments in the tissues, plus effects due to the structure of the cells. The range of these modifications produces great diversity in the three color constants—hue or tone, value or luminosity, and intensity.

The chlorophylls which give green colors are the dominant pigment in the leaves of actively growing plants. There are two main types of chlorophyll, and they differ somewhat in color values. The ratios of these two in leaves of different plants range from 6:1 to 3:1, giving a corresponding difference in shades of color. Chlorophyll is nearly always located in underlying tissues, and the number and the character of the non-green outer layers of cells modify the green. Colorless cells allow the green to show more clearly. Thick-walled cells, cells with other coloring and an epidermis with a waxy surface are among the conditions which give diverse color values. An abundance of epidermal plant hairs, as in the common mullein, will often entirely mask the green so that the leaves may appear to be almost white.

There may be other pigments of one or more kinds in cells along with chlorophyll, in which case there will be additional colors. Thus two or more colors may be perceived in a combined effect, or the green of the chlorophyll may be masked. However, it is to be noted that the green color in leaves is never the result of the combination of a yellow pigment with a blue pigment, as may be accomplished in painting.

The chlorophylls play an important and direct role in the absorbing of light and in the use of this energy in the manufacture of sugars. It is believed that the chlorophyll pigments are both manufactured and decomposed quite continuously in connection with the building of sugars.

Many of the white and the yellow mottled patterns and the striped or the marginate variegations in so-called foliage plants involve hereditary or inherent deficiencies in chlorophyll formation. When green cells and albino cells are associated in different layers, each of which maintains itself by cell divisions, a chimera results, as is seen in the albomarginate patterns of various foliage plants. Certain cases of mottled foliage are due to virus diseases; a conspicuous example is the well known Thompson abutilon.

But with the chlorophyll in the living plastids of cells there are nearly always compounds called carotinoids, which are simpler in chemical composition than is chlorophyll. One of these carotinoids is carotin, which is converted into the important vitamin A either during digestion or by ultraviolet light. The chemist finds a wide variety of carotinoid compounds, differing somewhat in degrees of oxidation and in other chemical changes. As a rule, the carotinoids are almost colorless, pale yellow or brown; occasionally some are red, as is the ripe fruit of certain tomatoes.

Most of the red, purple and blue pigments in foliage are sap-soluble materials known as anthocyanins. These are formed by chemical changes from the flavones, which are pale yellow in color and generally present in the plants that manufacture sugar and starch. In many species of green plants, anthocyanin pigments are formed in abundance throughout the entire life of the leaves. Such plants often provide gayly colored foliage throughout their entire span of life, and many of them are highly prized in horticulture as ornamentals during the summer season. The rich red sap pigments are present in the garden beet, and although they are more or less masked by the green in the leaves, they are abundant and conspicuous in the fleshy roots.

But it is in the dying leaves of the autumn that the foliage of our deciduous trees displays the most brilliant coloring. Many trees and other plants that have maintained a modest green foliage throughout the summer now burst into an array of gorgeous coloring. The fundamental processes in this phenomenon are simple. With the approach of autumn and winter, the lush, tender leaves of the deciduous trees and shrubs, and of most of the herbaceous plants as well, almost all die at the same time. The green pigments which prevailed in these plants during the summer quickly disappear. Now chemical changes in the carotinoids, which may have been inconspicuous during summer, give such clear yellow colors as are seen in willows, poplars and the tulip tree.

In most of the green-leaved trees and shrubs which develop red, purple or blue colors only in autumn, the pigments which give the colors are formed at the time from the almost colorless flavones. The anthocyanins give marked differences in color, ranging from scarlet to purple and blue, according to degrees and kinds of acidity and alkalinity.

The particular formation and display of pigments in different plants during summer and also in autumn are to a large degree hereditary. Thus the poplars and the ginkgo give only yellow, the red maple and the sour gum regularly give bright scarlet red, and white ash and sweet gum give purplish shades. Various degrees of mixture in the amounts and kinds of both the plastid pigments and the sap pigments, together with differences in acidity, are responsible for such variations in color as are seen in the tulip tree, sumacs, red oak, sweet gum and red and sugar maples. The chemical changes, too, are greatly influenced by such external conditions as light, temperature and moisture. These conditions vary from year to year. They vary for plants of the same species growing in different places; they vary even for the different branches and leaves of a single plant, especially in regard to exposure to direct sunlight.

The pigments which give gay color effects in plant tissues during autumn are somewhat unstable chemically, and the conditions in the dead leaves hasten further changes, especially in oxidation. Thus the leaves soon become brown and black, and in these stages other materials, such as tannin, may be involved. It is seldom that a

white or a colorless condition develops, or at least continues for any period of time. In various species the approaching death of leaves results in changes from green directly to brown or black.

It may be noted that the same pigments and, in general, quite the same conditions are involved in the developments of the colors in flowers and fruits. There is in these organs the loss or disappearance of chlorophyll, followed or accompanied by the color changes in plastid pigments and in sap pigments. In fruits, especially, the pigments are more lasting than in dying leaves because the tissues remain alive, or at least more juicy, for a longer time. The same may be said for such gayly colored roots as the scarlet radish, the purple-topped turnip and the orange carrot. The range of colors in flowers, fruits and vegetables duplicates the main colors seen in the autumn colorations of foliage, and the fundamental nature of the pigments is much the same.

The leaves of evergreens grow old and die. When an entire crop of the oldest leaves dies each autumn there is usually a considerable display of yellow and brown, as is seen, for instance, in the pines and spruces, or of yellow and brown and red, as in the rhododendrons. But in the most conspicuous cases, the autumn coloring of evergreens is masked by the one or more crops of green leaves that remain.

Many persons are somewhat surprised when they learn that autumnal colors occur only over a relatively small portion of the earth's surface. A large part of the land area of the earth is covered with deserts, tropical rain forests and coniferous evergreen forests, in all of which there are relatively slight seasonal changes in the aspects of the vegetation. It is in areas of the temperate zones, where the deciduous forests prevail, that autumn coloring is well developed. In the southern hemisphere there is only one small area of this type of forest, and it is located in the southern portion of South America.

In the northern hemisphere there are three rather large, but widely separated areas of these deciduous forests: One is in eastern Asia; another is in southwestern Europe, with narrow extensions northward along the Atlantic coast and eastward through south central Europe, and the third is in the eastern part of North America, extending from the Gulf of St. Lawrence to Florida and westward through the Mississippi valley to the great plains.

Those of us who live in the midst of the area last mentioned can appreciate the conditions that operate. The climate provides two sharply contrasted seasons: There is a warm summer with abundant rainfall, and there is a cold winter which prohibits plant growth. Year after year for ages this climatic cycle has occurred, and plants have been forced to develop habits of living suited to the abrupt transition from favorable to unfavorable conditions. One result has been the evolution of plants which either die or drop their leaves with the approach of winter, and of these the deciduous forest is a dormant type of vegetation. Often by the middle of summer the oldest leaves of certain species, such as the tulip tree and the sumacs, have aged and completed their span of life, and their death is accompanied by the development of gay colors. Frosts and freezing temperatures are not necessary for the initiation of autumn colors in many plants.

With the approach of more unfavorable conditions for growth, the leaves of the other deciduous plants die and are shed. Meanwhile, the aërial parts of herbaceous perennials die, the annuals die completely, and such evergreens as are present drop one crop of leaves. In each there are the color changes characteristic of the species or race.

The death and fall of leaves in these plants are to be viewed as adaptations in the modes of plant life to the repeated annual cycles of climatic conditions. The development of the colorful pigments appears to be incidental and to serve no purpose of direct benefit to the plant itself.

In respect to autumnal coloration, we in this northern hemisphere area live in a favored location. The climate gives the sharp contrast of a warm moist summer and a cold winter, with a rather abrupt transition. The dominant vegetation is largely deciduous trees and shrubs, many of which happen to possess the pigments which undergo those chemical changes which provide conspicuous color effects. The clear sunny days which promote these chemical changes often prevail. There is a fortunate, but somewhat fortuitous combination of conditions which brings the pageant of autumnal coloration to a degree of gorgeous perfection and beauty that is seen in few other areas of the earth and excelled in none.

MEASURE SOIL MOISTURE.

Nurserymen have found it difficult at times to regulate the soil moisture content in the forest nursery. The usual and probably the most practical method, says J. H. Stoeckeler, of the Lake States forest experiment station, at University Farm, St. Paul, Minn., is to take samples of soil with an auger or hollow tube from the center of the beds and to a depth of about twelve inches and, by appearance and "feel" of the soil, to estimate the total moisture per cent.

The next most feasible method is to make use of Livingston soil-point cones—a method favored by some nurserymen because only an hour's time is required to obtain results.

Another device used to some extent is the Livingston auto-irrigator, which measures the water-absorbing power of the soil. This device is handicapped to some extent by the fact that it cannot readily be moved from place to place, as can the soil points.

One of the most successful moisture meters, known as a "tonometer," is based on a principle which deals with the "capillary pull" of the soil. This instrument costs about $50 and is not readily adaptable to being moved from one set-up to another.

Mr. Stoeckeler appears to be rather partial to the soil-point method, but concedes there is no substitute for vigilant inspection of the soil with auger or a tube, supplemented by occasional oven drying of samples to serve as a check against ocular estimates.

"It is good policy in summer," he says, "to have an available moisture content of at least two to four per cent to a depth of twelve or more inches. By having this margin of safety an unexpected period of drought is not so likely to cause severe loss before the moisture deficit can be made up by watering."

Try Hormones on Trees

Results of Experiments with Root-Stimulating Chemicals on Trees and Shrubs for Transplanting Open New Prospects in Nursery Culture

Since it has recently been shown that root production can be induced on cuttings of many species of plants, normally difficult to propagate, by the use of certain chemicals, a logical question is what effect will these chemicals have on tree roots. In transplanting trees can the roots be treated to stimulate rapid new root development? Can root development be stimulated on a tree which has a weakened root system due to freezing, disease or some other agency? Paul E. Tilford, of the Ohio agricultural experiment station, tells of some tests made to answer these questions, in Arborists' News.

In January of this year, seedlings of American elm were treated by submerging the roots for forty-six hours in solutions containing ten, twenty-five and forty parts per million of indolebutyric acid, indoleacetic acid, indolepropionic acid and phenylacetic acid. Seedlings of American arborvitæ, Norway spruce, white pine, hard maple, black oak, pin oak and black walnut were treated for the same length of time with all four materials, but only at one concentration, twenty-five parts per million. Some of the trees were treated only in tap water for controls. After treatment, the seedlings were planted in sand in the greenhouse so that they could be taken up later, the sand washed off and the roots examined. Other seedlings of each species were potted in soil and watered once with solutions containing twenty-five ppm. of the chemicals. A dilution of ten ppm. is approximately one gram to 26.4 gallons.

No consistent differences in top growth were noticed on the variously treated seedlings. In some instances, however, indolebutyric and indoleacetic acids seemed to retard top growth for a time, but when the experiment was discontinued in March and April the top growth on no particular group of trees was uniformly better than on any other.

When the seedlings were taken out of the sand, marked stimulation of new root development was evident on all species except white pine and Norway spruce. In every instance, indolebutyric had the greatest effect. Usually indoleacetic ranked second, and indolepropionic third, while phenylacetic, at the concentrations used, had little effect. On the elms, large numbers of new roots were produced at the cut ends of old roots. In the case of one of the elms treated with indolebutyric acid, seventy-four new roots grew out from the cut end of the taproot. Black walnut reacted much like elm; most of the new roots developed from the cut end of the taproot. On the other species, however, the area of new root development was not restricted, but occurred more generally over the entire root system. This was especially true with pin oak.

While there was evidence in some instances of new root stimulation on the potted trees watered with the solutions, it was not nearly so marked as on those soaked in the solutions and grown in sand.

It is not known, of course, how efficiently these stimulated adventitious roots would function. On the elms and walnuts they were much larger than normal roots, but on the other seedlings they appeared perfectly normal.

The results of this preliminary experiment seem to indicate that root-stimulating substances may be of value in certain phases of tree culture. Considerable work will be required before practical recommendations can be made. Further experiments with trees growing outdoors are under way at the present time.

Tests on Shrubs.

During the winter of 1936-37 studies were undertaken to determine the feasibility of using some of the growth-promoting substances as aids in stimulating new root growth on the roots of ornamental shrubs, by L. C. Chadwick, at Ohio State University, who also reports his results in the Arborists' News.

Three-year-old field-grown seedlings of Viburnum dilatatum and Cotoneaster divaricata were removed from the field February 6 and 16 respectively, washed, root pruned severely and potted in 5-inch pots in loam soil of an acid reaction, high in nitrate nitrogen and potash, but relatively low in phosphorus. After the plants were treated with the growth substances, they were placed in a cool greenhouse.

The growth substances used in these tests were indoleacetic, indolebutyric and phenylacetic acids. Applications were made (1) by soaking the roots in solutions of two milligrams, five milligrams (cotoneaster only) and ten milligrams per hundred cubic centimeters for eighteen hours, (2) by applying 100 cubic centimeters of solution containing ten milligrams and twenty milligrams of the acids to the soil after potting, and (3) by coating the roots of the plant with emulsified paraffin containing the growth substances. The last-named method of treatment was used only with Viburnum dilatatum and, in general, such treatments were unsatisfactory.

With Viburnum dilatatum, soaking the roots eighteen hours in two milligrams per hundred cubic centimeters of indolebutyric acid gave the best results. Masses of new roots appeared near the end of the old roots where they were cut. Of the soil treatments the application of twenty milligrams per hundred cubic centimeters of indoleacetic proved the most satisfactory. The roots, however, were not so large and healthy in appearance as those appearing on the roots that had been soaked directly in the solutions.

The results with Cotoneaster divaricata were similar. Soaking the roots in indolebutyric acid, five milligrams per hundred cubic centimeters for 18 hours proved the most satisfactory. Indoleacetic acid, ten milligrams per hundred cubic centimeters, and phenylacetic acid, twenty milligrams per hundred cubic centimeters, proved quite satisfactory when applied to the soil after the plants were potted.

These preliminary experiments showed that considerable root stimulation could be expected by soaking the roots of the deciduous shrubs used in some of the growth substances. Applications to the soil after potting

may be useful under some conditions. Considerably more work needs to be done, especially in regard to practical commercial applications, before definite conclusions can be drawn.

A CENTURY AT FONTHILL.

This year marks the one hundredth year of business for the Fonthill Nurseries, Fonthill, Ont. For this anniversary, Stone & Wellington, Toronto, owners of the nurseries, have prepared a booklet describing the founding and growth of the enterprise, now operating 850 acres, the largest such enterprise in Canada. The booklet contains pictures of the men who contributed to its success and several views of operations on the grounds.

A small nursery business was started in the village of Fonthill, Welland county, in 1837 by Samuel Taylor, utilizing an area of 100 acres. Horticulture in Canada was not far advanced in those days, and it was a precarious manner of making a living. The business soon passed into other hands.

Dexter D'Evarardo, of D'Evarardo & Page, the next owners, is known as the real founder of the Fonthill Nurseries. Although his personal history is not well known, he appears to have been born in Paris and to have come to Nova Scotia early in life, eventually making his way to Fonthill. Somewhat eccentric by nature, he was nevertheless a famous figure in the neighborhood; his name has come down in local tradition with an aura of mystery and awe. The Lookout Golf and Country Club grounds, some of the most beautiful in Canada, were once owned and operated by Mr. D'Evarardo. He was buried in the Fonthill cemetery in 1891.

The next owners of the nurseries, Edward Morris, Mr. Hill, Mr. Weatherald and Mr. Balfour, enlarged the property considerably and put the business on a good financial basis. This association was replaced by one composed of Edward Morris, George A. Stone and W. E. Wellington. The present managers are F. W. Wellington and S. E. Davidson. A sales office, opened in Toronto in 1878, became the headquarters of the firm and is so today.

The variety of soils within a small area around Fonthill, ranging from heavy clay to rich loam, favors the growing of a great variety of shrubs, and the sheltered position of the grounds in a valley gives them protection against extremes of weather conditions. With the increase in population and the opening of many new projects in the Niagara region, the nurseries increased their range of operations until they attained a continent-wide reputation.

The staff at Fonthill includes many workmen who have been on the pay roll continuously for forty or fifty years, some of them succeeding their fathers in the work. Sixty men are employed steadily, with an increase into the hundreds in the spring shipping season.

AVERY H. STEINMETZ.

The inquiring and logical mind which brought Avery H. Steinmetz into the nursery business will be at the service of the American Association of Nurserymen while he continues on the executive committee, to which he was elected in July. After graduating from Oregon State College, Mr. Steinmetz entered into partnership in an orchard project in the state of Washington. His first job was to assist in the planting of several hundred apple trees, which were purchased from Stark Bros. Nurseries & Orchards Co. They were good trees, but Mr. Steinmetz could not understand why it was necessary to buy nursery stock from Missouri when the same material was being produced in large quantities in Oregon. So he became agent for the Russellville Nurseries, of Portland, and sold fruit trees during the winter season. His record was such that when he decided to give up fruit growing in favor of the nursery business, he had little trouble in obtaining a job with Albert Brownell, of the Portland Wholesale Nursery Co. Since 1921, Mr. Steinmetz has served the company in various capacities and now is on the official roster as secretary-treasurer. D. Brownell Marshall is president and J. Frank Schmidt is vice-president of the Portland Wholesale Nursery Co., which not only deals extensively in general nursery stock, but also in nursery supplies throughout the northwest.

Avery Steinmetz.

Mr. Steinmetz' attitude toward his office in the A. A. N. is well shown by his remark, "Mr. Brownell worked ardently for every cause that would benefit the industry, so quite naturally I learned to consider it my duty to co-operate in any way possible with nursery association work. The opportunity of serving on the executive committee of the American association is deeply appreciated, and I feel that the association can do a great deal to benefit the nurserymen in the Pacific coast region."

OAK GALL WASP.

The minute oak gall wasp is a tiny fly about a twenty-fifth of an inch in length which appears just as the buds of the white oaks are commencing to burst. The flies lay their eggs in the tender developing tissues and the maggots produce a purse-like, fleshy mass of aborted leaves about a half-inch in length, instead of the cluster of good-sized leaves which normally issue from a bud. This purse-like deformation of leaf tissues may produce some twenty-five to fifty, possibly more, gall wasps. The insects may be so numerous as to kill most of the buds upon individual twigs and sometimes upon groups of twigs, thus making impossible the production of leaves.

Those maggots which hatch from eggs deposited in the tender, succulent growth of the young leaves develop rapidly and in a few weeks escape from the galls as tiny winged insects. Occasionally some of the eggs are deposited in partly developed leaves. None of the eggs deposited in the older leaves develop because the leaf tissues have passed beyond the succulent, responsive stage, but numerous abortive galls develop to speck otherwise normal leaves with thousands of tiny blackish pimples.

Native Plants of Garden Value

Nineteenth in Series of Articles on Neglected Opportunities for Nurserymen in Native Material—By C. W. Wood

The genus physaria is a small one, being made up of four species according to the authorities on western plants. Just two, P. didymocarpa and P. Geyeri, are known to me and apparently not even these are known to many growers, for I find the genus mentioned in only two American lists. This is not as it should be, especially in the case of the neighborhood grower who can add to the number of items in stock without appreciably adding to his overhead.

May I stop here for a brief dissertation on the neighborhood nursery? You and I and thousands of other growers who depend upon local outlets for our stock will not, I am sure, ever get our full share of business until we quit emulating the large growers. It may be all very well for the latter to confine their inventories of perennials to delphiniums, phloxes, chrysanthemums and other items of universal culture, but how far are you and I going to get with our piddling quantities of these plants, particularly when it is necessary, as it is under present merchandising methods, to compete with the packaged stock which flows in and out of chain and department stores every planting season? Our only salvation, as I see it, is to offer our customers good garden material which they cannot secure through the other channels. I hope that I have not been unduly radical in the foregoing, but the matter weighs on my mind, as it must on everyone's else who has the interests of American horticulture at heart. And it is upon an enlightened and interested group of neighborhood nurseries, coupled with an informed gardening public, that the future growth and well-being of horticulture depend. Be not afraid, you of the neighborhood nursery, to carry a diversified line of material, knowing that in so doing you will be helping the cause of horticulture as well as yourself.

But to get back to physaria, which I started to discuss. The two species mentioned in the first paragraph are really good garden plants, being of easy culture and pleasing appearance throughout the year. First of all are their rosettes of canescent spoon-shaped leaves, unusual in their rosette-making habit and delightful in their whitish color. And then in early spring the circles of bright yellow flowers are in perfect keeping with the other plant parts. Their height of four to six inches is in the correct proportion for the rock garden scene, though they do not need that setting to show off their beauty. All that is needed to accomplish the latter is a sunny spot that is well drained in soil that is not too rich. Propagation is easy from seeds.

Polygonum.

There was a rather full discussion of knotweeds in these columns within the past year or two; so space will not be taken at this time to point out all the good natives. No mention was made at that time, however, of a native twiner, Polygonum cilinode, and the plant is good enough to have some attention. It is not, to be sure, to be compared with the two Oriental climbers, P. baldschuanicum and P. Aubertii, but our present plant really serves a different purpose, being most useful to clamber through shrubs or to cover rocky slopes. It is a slender climber with a rather sparse covering of usually cordate-ovate, slightly downy leaves and racemes of white flowers. It is not a spectacular plant, but has its uses as outlined and no doubt in many other spheres. Propagation is from seeds, preferably sown in autumn.

Potentilla.

Potentilla is a large genus of the rose family. I have no idea how many species are native to North America, but the number is far in excess of the general conception, perhaps more than 100 being native to the United States alone. As is the case in most large groups, we find many weeds in this genus; on the other hand, it contains not a few splendid garden plants, including kinds for border, wild garden and rockery.

Of the latter, perhaps P. villosa is the best known. This is quite a cosmopolitan plant, extending its range from arctic Asia throughout much of North America, and as it travels it varies not a little, mostly in size of plant and silkiness of foliage. I have had plants from lowlands that grew ten inches high, while I have a few plants now that were grown from seeds collected on Mount Jasper, in Canada, which are scarcely over three inches high. Regardless of their origin, I have never had one that was hard to manage in the garden. All they require, apparently, is sunshine and good drainage, and they will make a brave display of silvery, silky tufts throughout the open season with the addition of quite large, golden yellow flowers during June and July.

P. uniflora is another small, silvery elf, coming from the high Rockies. I have found it less amenable than the preceding, though not too difficult for the understanding gardener. According to my experience, it is best in the climate of the middle west when given a gritty, acid soil where it does not get the noonday sun. In a pocket in a north wall it has given a satisfactory performance here over a period of years. I have read glowing accounts two or three times about P. angustifolia, another plant of the high Rockies, but can add nothing from personal experience, for a search of perhaps fifteen years has brought no results. It is said to be a plant of 2-inch stature that bears showy crimson flowers. It is mentioned here with the hope that it will excite enough interest to bring it to light.

I should like to go on with native cinquefoils, but this series is getting overlong now and we still have quite a distance to travel. Suffice it to say that, aside from the kinds generally known to gardeners, there are a number of other natives known to me that possess garden value, and no doubt there are many more that I have never heard about. Their propagation from seeds is not difficult and, except for the hybrids with which we are not now concerned, offers the quickest and surest method. Many species may be successfully divided

in spring, and a few kinds, like P. fruticosa, grow readily from cuttings.

Ranunculus.

Now the buttercups are another story; the good ones, particularly the good American kinds that have come my way, are not easy to handle, and the seeds are the most perverse actors I have ever tried to germinate. There is ample reward, however, for the careful gardener among the better kinds. Just three will be mentioned at this time, all three of them inhabitants of high places in the west and all needing careful attention as to culture, including moisture at the roots throughout the growing season. The first of them, Ranunculus adoneus, is a 3-inch to 5-inch buttercup with large, yellow flowers, one or two to the stem. R. Eschscholtzii under lowland conditions is a slightly taller plant, usually around eight inches, and its flowers are smaller, though of the same delightful yellow. Both come from the regions of eternal snow and consequently need water trickling between their toes at all times. That calls for wet moraine treatment in the east. R. Suksdorfii is a subalpine that is apt to become a nuisance if it likes the spot assigned to it in the garden. It needs moisture to insure a good performance, though not necessarily a moraine; a stream bank or a spot that catches seepage makes an excellent home. It grows up to eight inches in height, producing bright yellow bowl-shaped flowers during July. They are to be grown from seeds—a difficult task, requiring fresh seeds and patience while they are deciding whether to germinate or not.

Rhexia.

Rhexia virginica is remarkable in more ways than one. It is, first of all, one of the few temperate zone representatives of a family of predominately shrubby plants of the tropics, though in the present case we are discussing an herb. And we are further surprised when we find that the roots bear many tubers, which form a ready means of increase.

It is rather remarkable that this vivid plant with so wide a range in the eastern and southern states (it runs from Maine to Florida and from the southern Great Lakes territory and Iowa southward) is so seldom seen in gardens and nurseries. I suspect, though, that its natural habitat in swamps has led most observers to take for granted that it needs such a location to thrive. On the contrary, it should do well in any garden that is not desert dry. I have found that in my light sand the addition of a generous portion of leaf mold benefits immensely. There is really no reason why it cannot be grown by all nurserymen and with little care even in the drier sections. I like to sow the seeds in early April, carrying the seedlings (they are rather delicate during that stage of growth) along in a shaded frame during the first summer. Incidentally, the plant may be forced readily in late spring by potting up tubers in autumn and bringing them in to heat in winter.

The plant makes a bushy growth from a foot to eighteen inches high, stems being clothed in ovate leaves an inch or two long and half as wide. That makes a pleasing object in itself, but when it is displaying its inch wide, or wider, rosy purple flowers during most of July and August and part of September, it is really brilliant. Be not dismayed by the color description, for it is not a shade to offend any but the most anæmic souls.

NEW HYBRID MAGNOLIAS.

Since it was shown in June, 1930, that the sweet bay, Magnolia virginiana, and the southern magnolia, M. grandiflora, could be crossed even though their chromosomes numbered nineteen and fifty-seven, respectively, hybridization experiments have been in progress in the hope of securing a magnolia hybrid hardier than the southern magnolia, but fully as worthy as a garden subject. Oliver M. Freeman, associate botanist in the division of plant exploration and introduction of the United States Department of Agriculture, describes these experiments in the July issue of the National Horticultural magazine.

Four of the original hybrids are still growing well, but they have not produced flowers. In June, 1931, 176 seeds were secured by cross-pollination and they produced 121 plants. These plants were set out in the nursery at the national arboretum, Washington, D. C., in the spring of 1933. Seventy-seven of these plants survived the drought—the nursery watering system was then incomplete—and four bloomed this spring. Although the seeds were produced on the sweet bay, all of the plants resembled the pollen parent. The flowers were intermediate in size between the parents and had a pleasing fragrance. They appeared normal, except that the anthers contained no pollen. It is probable that the pistils are sterile and that pollination with either of the parents will produce no fruits. Tests for sterility cannot be completed until a larger number of seedlings have flowered.

These hybrid magnolias are similar to seedlings of the southern magnolia, not only in appearance, but in variation. The leaves vary from oblong-lanceolate to broadly ovate, and on one of the plants, part of the leaves are retuse. Some of the plants are vigorous; others appear stunted. The better types have dense foliage, yet some are too thinly covered to be of horticultural interest. Hardiness, too, has proved variable among the seedlings. Some were injured during the two severe winters of 1934-35 and 1935-36, but no injury occurred during the past winter, all of the plants retaining their foliage. It is expected that some of the seedlings will prove hardier than the southern magnolia, for although the plants lost their leaves during severe winters, many of the best specimens showed no twig or bud injury and grew normally the following spring, developing a heavy coverage of foliage.

THE BEARBERRY.

The bearberry, Arctostaphylos Uva-ursi, has been mentioned in these columns several times. Horticulture states that it is strange that the bearberry is not seen more often in gardens, for it is a common plant in the eastern states and the sandy banks along the roadsides on Cape Cod are covered with it. The American Botanist points out that it is one of the most decorative plants in the garden in winter. When winter comes, the leaves, which are evergreen, take on shades of rust and maroon and keep the garden colorful until spring.

The fact must be recognized, however, that the bearberry is a little difficult to establish, although it grows rapidly when once started. The bearberry thrives on sandy slopes that are free from lime, but will grow well in heavier soils.

Charlie Chestnut

Visits with the Landscape Trade

There is a landscaper that comes to our place once in a while and his name is Elmer Hench. He come last Sunday about 3:30 in the p. m. Some of the boys was out on the yard waiting on some customers and Elmer come in the office where we have a stove and 2 chairs that my bosses wife used to have in the house before she bought her new parlor sweet. Elmer is one of our honest customers. He has never given anything but a square deal he says and that is why he has so many old customers that call him up every year to come and do there work in their yards. It was a little chilly in the office so Elmer did not take off his felt hat which he wears summer and winter. Elmers eyes are bad and he wears thick glasses which is fastened on one side with a piece of adhesive tape as Elmer says he has been too busy to get them fixed. He has had the same tape on them for 4 years that I can remember. One great satisfaction that Elmer gets is one long continuous chew of tobacco which starts off the first thing in the morning before breakfast. We do not have any cuspidors in the office, as we could not get anybody to empty them and they got to running over all the time so we threw them out. Elmer sat for quite a few minutes by the stove and every once in a while he was looking around like he was trying to get his eye on the cuspidor. Finally I seen him take a big gulp and his adams apple run up and down three or four times. Hell he says a feller cant be running out doors just to spit. I says dont that make you sick at your stomach and he says not if I dont do it all the time.

After a while I says Well Elmer what can I do for you? Oh nothing he says I was just going to a picnic at St. Charles as my sisterinlaw is having her folks in for dinner and she asked me to come. (Elmer is a batch and lives with his sister) But I got to talking with Mrs. Brewster that wants to put in a yew hedge and now I am too late for dinner. (It was already almost 4 oclock) But I will have to go down anyway or it wont look right he says. Say, he says, did M. J. order 100 Sycamore from you folks. M. J. is his chief competitor. You know, M. J. lies so, he says. M. J. says he has got enough tree-moving to last all winter but I dont see how he does it as he aint got any equipment. I remember one time I give a price of $125.00 to move a 12-inch maple in Aurora. I knowed the feller well as I used to buy tires from him when he run a place on Fox street. A few weeks later I seen him and I says Charley how about that tree-moving job and he says Well Elmer I give the job to M. J. as he give me a price of $25.00. Hell I says there aint anybody can move it for that money and he is going to have trouble with it. Sure enough MJ called me one day in January. Remember it was that year we had that heavy ice storm and he says Elmer can you help me out moving that maple. I said whats the matter with your equipment. I says I thot you was a big tree mover. Boy I knowed I had him in a bad spot. Finially I said why M. J. I wouldnt touch that job for less than $125.00 cash. Wells says M. J. I figured the job a little low and he says if you will let me use your equipment I will give you $10.00 and furnish my four men and every thing will be fine. I says M. J. you know that in this cold weather some of the ropes or the cable will snap and then that is a big expense. I says no, M. J., $125.00 or nothin. Well sir he says I guess I am stuck so go ahead and move it. Well that was 7 years ago this winter but I aint had no trouble with M. J. on tree-moving since. I thot he was all through talking but it turned out that he had just taken time out to spit.

Did I tell you about that Post Office job I figgered at St. Charles? My cousin is janitor at the building and he says he can probably fix it so I can get the job. The contract calls for moving in about 200 loads of black dirt. I took a contract to dig a 8-foot ditch across that convent property down next to the river so I can get the dirt for nothing. M. J. figgers he can beat me on it as the contract calls for 10 big hawthorns which M. J. claims he has bought from a farmer at $1.00 each and they want $25.00 each at the F. & M. Nursery where I have been buying some stuff. Boy will M. J. be surprised when he hears my bid. He dont know that I get my black dirt for nothin.

Say, M. J. was telling me he has bot over $400.00 worth of Evergreens up here last week but he lies so. My god he lies something terrible.

Well, says Elmer, I got to be getting on to my sisterinlaws. They was expecting me for dinner but I couldnt get away from Mrs. Brewster, she's a great talker and you cant just break away from your customers you know, they notice it right away.

He went out to his car but he was back in a minute. Say I got a good one. I was doing some planting for a man down home and he stood there watching a while and he says, Well Elmer you may call that landscape gardening but its just another name for the hardest kind of manual labor.

Pretty good aint it. Well I'll be up to see you if I get that order from Mrs. Brewster. Don't say nothing what I told you about M. J. So long.

COLLECT TREE SEEDS.

More than 1,500,000 pounds of tree and shrub seeds and nearly 700,000 pounds of native grass seeds will be collected between now and next July for use in the nation-wide erosion control program, estimates H. H. Bennett, chief of the soil conservation service. Collection work is already under way in most of the 374 C. C. C. camps assigned to the service.

About twenty per cent of the tree and shrub seeds will be turned over to service nurseries for production of the more mature planting stock.

Most of the tree and shrub seeds collected will come from middle western states and from the east. From the middle west the service nurserymen will seek Russian olive, green ash, cedar, black walnut, hickory and pecan tree seeds. From the east they will look for seeds produced by tulip poplars, pines, oaks, elms and plum trees.

GROWING an annual cover crop in the cultivated orchard and the maintenance of the trees in a permanent sod are two of the principal ways a fruit grower can add to or build up the fertility of his soil.

Rise of the Blueberry

Popular Fruit Has Been Developed Within Brief Period of Three Decades

IMPROVING THE BLUEBERRY.

It was only a short time before his death, January 9, 1937, that Frederick V. Coville completed a paper for the 1937 yearbook of the United States Department of Agriculture describing his work in developing the cultivated blueberry from the wild blueberry. Dr. Coville served forty-nine years in the Department of Agriculture and his work with blueberries probably will stand out as the most important achievement of a fruitful career. It founded a new and thriving industry.

The work began in New Hampshire thirty years ago, in 1906, with a study of the fundamental facts in the life history of the wild blueberry. The first fact established was one not before known—that blueberries, rhododendrons, azaleas, mountain laurel and many other plants require acid soils. Next, methods of grafting, budding, division, layering, propagation of twig cuttings and root cuttings and pollination were worked out.

Plants with superior fruit were chosen for breeding experiments. The first one, a highbush blueberry found in a pasture in Greenfield, was named Brooks. To the excellence of this first berry, Dr. Coville attributed much of the success of many of its later descendants. After unsuccessful efforts to self-pollinate the Brooks, this method was abandoned in favor of cross-pollination. Much later, it was found that chromosome numbers were all-important in cross-pollination. Even distantly related plants with the same number of chromosomes would cross, but if they did not have the same chromosome numbers, the cross yielded no fruit. The second wild blueberry chosen was Russell, also from New Hampshire. In 1911 this was crossed with Brooks and some of the first-generation hybrids were crossed with each other. Among 3,000 second-generation progeny there was much segregation for various characteristics.

Thereafter, Dr. Coville made an intensive search for superior wild berries, enlisting the coöperation of Miss Elizabeth C. White, of New Lisbon, N. J. Up to the year 1936 about 68,000 pedigreed blueberry seedlings were fruited and carefully tested for superior characteristics of bush, size of fruit, ease of picking, size of scar when picked, size of calyx, keeping quality, firmness, tendency to crack and flavor. Taste tests were especially exacting and, with the consumer in mind, Dr. Coville would release no variety, no matter how remarkable its size or how good its other commercial characteristics, unless its flavor met his standards.

The largest berry developed in this work had a diameter of more than one inch, but it was not released because of inferior flavor. A hybrid between this and the finest-flavored berry, Stanley, has so far reached a diameter of nearly one inch. It is not yet ready for release, but Dr. Coville named it Dixi. His paper in the yearbook describes the characteristics and ancestry of all his improved varieties: Pioneer, Greenfield, Cabot, Katharine, Rancocas, Jersey, Concord, June, Scammell, Stanley, Redskin, Catawba, Wareham, Weymouth and Dixi.

HIGHBUSH BLUEBERRIES.

Blueberry culture at Whitesbog, N. J., began in 1911 as a result of an offer made by Joseph J. White and his daughter Elizabeth to coöperate with the late Dr. Frederick V. Coville, chief botanist of the United States Department of Agriculture, in continuing his research and experiments in blueberry culture. In 1916, about 600 quarts of cultivated blueberries composed the first shipment from Whitesbog. In 1936 more than 600,000 quarts were moved by the Blueberry Coöperative Association.

A continuous search for the best wild blueberry bushes was maintained from 1911 to 1916. Whitesbog is located in the pine barrens of New Jersey, about thirteen miles west of the naval air station at Lakehurst. Native cranberries and blueberries were harvested there long before Columbus discovered America. Some seventy-five years ago the cranberries were brought under cultivation, but the blueberries continued in their original wild state.

The inhabitants of the barrens first pick wild blueberries for market and then join in the cranberry harvest during September and October. Many of the pickers kept secret the knowledge of localities where the best blueberries grew. Offers of attractive fees for samples of the best berries and good wages for guiding Miss White to the marked bushes enabled the Whites to secure cuttings of the best wild bushes. From 1911 to 1916 an even 100 superior wild bushes were located, each of which was the start of a separate variety, usually named after its discoverer.

From twenty-five to 300 plants were propagated from each one of the original 100 wild bushes. The separate varieties were planted in test rows, grown to large size and watched for a number of years to determine the varietal characteristics, both good and bad. Size of berry was the obvious quality on which the first selection of wild bushes was made, but good flavor, aroma and satisfactory texture were found even more important than size. The vigor and hardiness of the plant also had to be considered. For one reason or another, many of the original varieties were discarded.

Plants of the most promising of the original wild varieties were given Dr. Coville. In the greenhouses of the Department of Agriculture at Washington, he cross-pollinated them and grew thousands of seedlings, which were sent to Whitesbog when about one year old to be grown to fruiting age under the care of Miss White. For the past ten years blueberries have been bred at Whitesbog independently of the Department of Agriculture, and over 200,000 seedlings, a few of which hold great promise, have been produced.

Blueberry bushes are valuable not only for commercial fruit production, but they are well adapted for use in the home plantings. In spring the dainty foliage and the great clusters of snowy white flower bells, suggesting those of lily of the valley, unfold at the same time. Many varieties have crimson-tipped flower buds. Summer beauty reaches its peak when the clusters of fruit are ripening "just like grapes." The cool tones of the frosted green, pink and blue fruit of the laden

bushes show vividly against the deep green foliage. Autumn brings brilliant reds to the blueberry bushes and, when the leaves finally drop, the color of the bush does not fade to gray because the bark of the twigs remains a soft, deep crimson throughout the winter.

Blueberries need an acid, well aërated soil, amply supplied with old decaying vegetable matter. They cannot grow in compact clay or in any soil so water-logged that air does not penetrate freely. Neither can they withstand much drought. A mulch of leaves, hay, peat moss or almost any vegetable matter allowed to rot in place and renewed on top from time to time helps supply satisfactory conditions. Their requirements are similar to those of rhododendrons and azaleas.

MONTANA BLUEBERRIES.

Near the villages of Heron and Noxon in the Clark Fork district of Montana, a short distance northwest of Thompson Falls, wild blueberries are an important annual crop. The blueberries, called huckleberries in that territory, grow high on the mountains, not far from the snow line. Nearly all are on public domain and pickers come from as far away as Seattle and Tacoma to harvest the crop.

By using pan pickers and beating the bushes an experienced man can gather as many as fifty gallons a day, but he needs two or three assistants to transport, clean, grade and pack the berries he gathers. The season extends from August 1 to September 1, and activity is at its height about the middle of August. The value of the crop is from $25,000 to $50,000 each year, depending on the market for the berries.

HUMUS FROM PRUNINGS.

The problem of keeping up the humus supply in the soil is important with many crops. How raspberry prunings were ground up with an ensilage cutter and used as a mulch in a raspberry field is told in the Michigan quarterly bulletin. The raspberry requires a soil high in humus content, and lower crops year by year are undoubtedly due to reduced soil fertility and to reduced organic matter content of the soil.

By weighing the green prunings after removing the old canes in the summer following harvest, a Michigan raspberry grower found that the average weight of green canes and leaves was two tons to the acre, and he estimated that the spring pruning removed another half ton per acre. So in 1933 he began using his ensilage cutter, hauled and powered by a tractor, to grind the prunings and deposit them in a finely chopped condition beneath and behind the machine as it passed down the rows. Apparently this finely chopped refuse quickly decomposed in the soil, for little coarse material was found during the following season's cultivation. The possibility of virus disease spread was considered, but during the four years there has been no evidence of increased disease. Six years after planting, there is almost a perfect stand.

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ROADSIDES

THE FRONT YARD OF THE NATION

By J. M. Bennett

Superintendent of Parks and Forestry Board of County Road Commissioners, Wayne County, Mich.

Beautification of highways by the planting of trees and shrubs has been immensely stimulated by government appropriations for relief projects in recent years. Such work deserves the support of everyone interested in horticulture for its own merit and for the interest it engenders in the motoring public in such plant materials for private landscape use. Here is a book explaining what is being done and how. You should keep posted yourself and be ready to help your community in such projects.

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Pear Improvement

Extensive Breeding Projects Favored by Wide Range of Available Material

Europeans have the same fondness for pears that Americans have for apples and a great many delicious varieties have been developed in Europe. A Belgian physician, Von Mons (1765-1842) had as many as 80,000 seedlings in his gardens and developed over 400 varieties. At least as early as 1794, however, pears in America met the nemesis that has dogged them ever since, writes J. R. Magness in the 1937 yearbook of the United States Department of Agriculture. This is fire blight, a bacterial disease that attacks roots, crown, trunk, limbs, blossoms and fruit. It is ruinously virulent in most of the east; in the west, relatively cool dry summers make it less destructive, but even there, it is a source of great trouble and expense to growers, since the only known method of control is by careful surgery.

Thus the fire blight menace dominates pear breeding in the United States. The European pear, source of all the fine-fleshed, buttery, melting, aromatic varieties, such as Bartlett, Anjou, Buerré Bosc and Winter Nelis, is especially susceptible. The Chinese or sand pear, coarse, gritty and inferior, is resistant. About the middle of the last century, hybrids between the European and the Chinese pear began to appear, Le Conte and Kieffer, for example. Although these are inferior in quality, they are about the only pears that have enough blight resistance to be grown in most parts of the east. One pear apparently of straight European parentage, the Seckel, is also resistant.

Blight Resistance.

The problem, then, is to develop a wider range of the superior European varieties with resistance to the disease, either by hybridization or by selection. The most important basic breeding material includes the European pear (generally susceptible but with occasional resistant forms), the snow pear of southern Europe (susceptible), the Chinese or sand pear (variable resistance), the Ussurian pear of China and Siberia (very resistant, and especially valuable because the quality is fair), the Callery pear of China (resistant) and the birchleaf pear of China (variable resistance). There is enough range in the available material to meet all requirements, including superior winter hardiness, which is needed in some parts of the country, but it may be another hundred years before the problem of fire blight is really solved, considering the length of time it takes to test a single generation of tree fruits.

The Oregon station has led in this work. There F. C. Reimer has tested the resistance of practically all known species and varieties of pears, and of many hybrids, using artificial inoculation as well as natural infection. One of the most valuable breeding stocks is a highly resistant Anjou seedling called Farmingdale, found accidentally on a farm in Illinois. Ten other resistant European pears have been found in 10,000 seedlings, and all transmit a high degree of resistance in crosses.

The federal department has also carried on fairly extensive breeding work for blight resistance, and 5,000 seedlings, inoculated each year, are now being grown to fruiting. Work has also been done in California, Georgia, Iowa, Maryland, Michigan, Minnesota, New York and Tennessee. Some new varieties have been introduced as a result of this work.

PLUMS FOR IOWA.

Planting more plum trees, even a million of them, is urged upon Iowa soil owners by C. V. Holsinger, of Iowa State College. Every farmer should have at least six such trees, representatives of two or more varieties, he says. Among the new hybrids available he recommends Underwood, Redwing, Monitor and Tonka, the large-size plums developed at the Minnesota station. Sata, Opata and Waneta, varieties originated by N. E. Hansen, of the South Dakota station, are held to be particularly adapted to northwest Iowa.

TEXAS FRUIT VARIETIES.

Some of the pioneering nurserymen in Texas did valuable work in importing and selecting new fruits, said Ross R. Wolfe, speaking at the recent Texas Nurserymen's Association convention, on "Variety Studies for Texas." Outstanding among these were John S. Kerr, of Sherman; E. W. Kirkpatrick, of McKinney; Gilbert Onderdonk, J. M. Ramsey, of Austin, and others. These men gladly spent their time and money in an effort to find fruits suited to various sections of the state.

We have had three outstanding men in Texas in breeding varieties, each working with one plant. T. V. Munson, of Denison, created many valuable grapes and his accomplishments have been recognized all over the world. E. E. Risien, of San Saba, created by breeding a large number of the finest pecans and his accomplishments have been recognized with a gold medal by the Texas Pecan Growers' Association and a resolution of honor from the Texas legislature. The third man is J. W. Stubenrauch, of Mexia, who has bred peaches to produce varieties that will bear in sections having mild winters.

The Munson Carman grape is our most popular Texas variety. The

FRUIT TREE SEEDLINGS
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Risien Western Schley, John Garner and San Saba Improved pecans stand at the top of the list of western pecan varieties. The Stubenrauch Frank, Carman, Tena, Katy and Barbara are outstanding in the list of Texas peach varieties.

The Frank peach, a cross of Elberta and Bell's October, was named at a Texas farmers' congress in honor of Frank Holland, of Farm and Ranch. It has not missed a crop at Mexia in thirty-five years. The Frank is a yellow and red clingstone, with small sound seed, ripening from ten days to two weeks after Elberta; the flesh is yellow and red, with a sweet and delicious flavor. It hangs on the tree from a week to ten days after ripening, is firm and can be shipped to distant markets. It bears so heavily that the fruit has to be thinned on the tree. It is fast becoming the commercial peach of Texas.

Securing varieties that are successful for the planter is important in building and enlarging the nursery business. Every failure in planting directly hurts the nurseryman. Successful planting means more plantings. It is the duty, as well as opportunity, of the nurseryman to know the varieties of plants adapted to his customers, and working for the benefit of his customers will in turn increase and make his own business more profitable and make the state more beautiful and fruitful.

NUTS IN THE NORTH.

Nut culture in the colder northern tier of states is attended by certain difficulties, such as cold winters, short growing seasons and limited rainfall.

To supply information on nut culture in that region, Prof. A. F. Yeager of the agricultural college at Fargo, N. D., has prepared for the report of the Northern Nut Growers' Association a paper entitled, "Nut Culture in North Dakota."

The only native nuts are the American hazel and the beaked hazel, both being found along streams and in protected places where native trees are present. Native hazels from other regions that will live at the North Dakota experiment station thus far are too unproductive to recommend their culture for nut production.

Black walnuts have been growing and fruiting at Fargo for at least thirty years and have withstood record-breaking winters and droughts without killing back. However, they begin growth so early in the spring that late frosts frequently kill back the tips and destroy the crop of nuts. Black walnut seed from these trees has been distributed throughout the state and the Canadian provinces to the north, and in favorable locations the resulting trees seem to be doing fairly well. Thomas top-grafts are living, but have not yet fruited. Seedling black walnuts begin to bear in ten or twelve years.

Butternuts will withstand cold better than the black walnuts, but are not so well adapted to withstand drought. The tree tends to drop its crop under drought conditions. Seedling trees start bearing at 4 years of age and at 10 years of age are about that many feet in height.

Several attempts to grow hickories of various species have failed. The best to date have regularly killed to the snow line.

BUD-GRAFTED EVERGREENS.

The bud graft, long used in propagating fruit and nut trees, is being used by the United States Department of Agriculture to propagate evergreens. Several new seedling crosses have been grafted successfully to ponderosa pine rootstocks at the forest service experiment station in California.

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Elm, American, 1½ to 2-in. cal.	9.00	80.00
Elm, American, 2 to 2½-in. cal.	12.50	115.00
Flowering Crab, 3 to 4 ft.	4.00	....
(Eleyi, Floribunda, Hopa, Sargentii)		
Japanese Cherry, 3 to 4 ft.	7.50	65.00
Japanese Cherry, 4 to 5 ft.	8.50	75.00
Jap. Weeping Cherry, 1-yr., 5 to 6 ft.	13.50	125.00
Maple, Norway, 8 to 10 ft.	9.50	85.00
Maple, Norway, 10 to 12 ft.	11.00	100.00
Maple, Norway, 2 to 2½-in. cal.	20.00	185.00
Oak Pin, 2 to 2½-in. cal.	25.00	....
Oak Pin, 2½ to 3-in. cal.	40.00	....
Plane, Oriental, 2½ to 3-in. cal.	20.00	....
Poplar, Lombardy, 6 to 8 ft.	2.50	20.00
Poplar, Lombardy, 8 to 10 ft.	3.00	25.00
Poplar, Lombardy, 10 to 12 ft.	4.00	35.00

Write for prices on other varieties and sizes.

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Airplane vs. Insects

Orchard and Forest Plantings among Those Now Being Dusted from the Air

Hangar No. 3 of the Los Angeles municipal airport, at Inglewood, Cal., has been taken over on a 5-year lease by Aero Crop Service Co., which is developing apparently unlimited possibilities in airplane dusting and planting. Special dusting planes are being manufactured, and a school for airplane mechanics, builders and flyers who wish to specialize in this branch of the industry has been added.

This branch of aviation has already been attracting considerable notice because of the remarkable manner in which it has responded to the needs in certain pest-infested areas.

The Mormon cricket invasion of Elko county, Nevada, was an outstanding example, when inspection after the air dusting disclosed millions of carcasses drifted in piles throughout the area. The poison used to exterminate the crickets was a stomach poison, which adheres to the leaf and is eaten by the insects. It is not of sufficient strength to be harmful to humans or animals. A body poison has also been used effectively in other cases, as well as a treated bran mash for grasshoppers.

It is claimed that more ponderosa pine in Oregon and Washington is destroyed by beetles than is cut and eight times as much as is destroyed by forest fires. This presents a problem for the airplane duster which will undoubtedly be met. Efficient dusting in the past has been done by low flying, and one of the features which has contributed much to its efficiency is the fact that the dust or liquid spray, as the case may be, is discharged with such force that it "boils" up and covers the underside as well as the upper side of the plants. Higher flying will be necessary for covering the pine forests.

Orchards, however, are being successfully sprayed, particularly deciduous fruit trees. Grapes, alfalfa and peas are among the largest crops treated in California.

It is not only the insect-destroying utility of the system which may solve certain problems; there are definitely constructive accomplishments which are most remarkable.

Sixty to 600 acres can be completely covered in sixty minutes. Hence, inestimable results in the saving of time and labor, as well as added productivity of land, may be obtained by the distribution of lacking soil elements, sulphur and fertilizer.

Rice sowing in California is an important branch of the work, since the even spread and complete coverage of the latest models have been perfected. Airplane sowing promises planting in flooded fields, resulting in quicker germination, and prevents birds' eating the seeds.

Kenneth C. Hawkins, president of the Aero Crop Service Co., formerly a naval officer, graduated from the United States Naval Academy in 1919, after which he specialized in engineering and attended postgraduate engineering schools. He completed the course in naval aviation at Pensacola in 1923, since which time he has acquired over 4,000 pilot hours and a wealth of experience in aviation operation, management and engineering.

In South America, Mr. Hawkins early grasped the opportunity presented by the crop service idea. He severed connections as maintenance engineer of Pan-American Grace airways, and took over the old Huff-Daland operations in Peru. During 1934-1935, Mr. Hawkins increased the business of this company from 3,000 to 35,000 acres, which was all the available equipment could handle. He developed a plane and personnel which effected the most thorough and economical application of calcium that had ever been obtained.

The coverage was so satisfactory that an application of five to six pounds of calcium arsenate per acre resulted in a kill of between 95 and 100 per cent of the army worm infestation.

PLANNED HIGHWAY BEAUTY.

Nurserymen are thoroughly in accord with the demand of the motoring public that highways be beautified. In many places the insistence by the general public on more attractive roads has resulted in county zoning boards that are empowered to designate the types of buildings permitted along the county roads and are influential in having barren roadsides planted with shrubs and trees. In Texas Parade, a monthly publication of the Texas highway department and the Texas Good Roads Association, Jac Gubbels suggests layouts for service stations, roadside refreshment stands and rural homes that emphasize the use of trees and shrubbery surrounding spacious lawn areas and parking spaces.

The competition among filling stations and roadside refreshment stands has frequently resulted in extensive and often unpleasant outdoor advertising. Normally beautiful vistas are marred or concealed by billboards and signs inviting the patronage of

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Special reduced prices.

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2000 from 1 to 3½-in.
Write for prices.
Must move them this fall.

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STOCK YOU WILL NEED

Cotoneaster Acutifolia, 18 to 24 ins.; 2 to 3 ft.
Cornus Paniculata, 18 to 24 ins.; 3 to 3 ft.
Cornus Sibirica, 2 to 3 ft.; 3 to 4 ft.
Rosa Setigera, 18 to 24 ins.; 3 to 4 ft.
Rosa Blanda, 18 to 24 ins.
Ribes Alpinum, 15 to 18 ins.; 18 to 24 ins.
Rhus Canadensis, 18 to 24 ins.; 3 to 3 ft.
Balleana Poplars, 5 to 6 ft.; 6 to 8 ft.
Ask for quotations
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KALMIOPSIS LEACHIANA

Dwarf evergreen shrub, related to Rhododendron; dark green foliage and heads of pink flowers from May to July. Very hardy and drought resistant; easy in neutral or slightly acid soil. 2½-in. pots, $7.50 per 10, $70.00 per 100. Express.

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the motorist. Customers can be attracted by means other than disfiguring roadside advertising. Sightly grounds and structures are a permanent investment in bidding for business. The surroundings, through their neatness and beauty, should be a contrasting note on the roadside. A broad, inviting driveway should be visible for a distance and ample space should be provided for service and parking. To complete the layout, a background of shade trees, hedges and flowers should be planted. Masses of colorful plants give character and individuality far more effectively than unsightly signs and billboards.

Nurserymen can help themselves as well as the general public by selling the proprietors of roadside establishments the idea of beautifying their places of business by landscaping their surroundings appropriately. Landscaping roadside establishments will add to the weight of public opinion demanding more roadside planting. A continuous program of roadside planting will result in elimination of many of the eyesores that now exist along practically every highway. Both mean opportunities for service and profit for the alert nurseryman.

FOREST TENT CATERPILLAR.

The forest tent caterpillar has caused complete defoliation over wide areas in western Massachusetts, Vermont and New Hampshire, but it is easily controlled by spraying with arsenate of lead. Many villages and towns have perfect foliage on their street trees, while outside the town limits in unsprayed areas defoliation is almost complete.

AUTHORITY has been given the newly created Louisiana state horticultural commission to require persons engaged in entomological, pathological or tree surgery work to obtain licenses and bonds up to $10,000 each.

A SPECIES of tree with a top naturally smaller than that of the stock upon which it is grafted may not be fruitful; species of other hickories grafted upon pecan stocks furnish examples. Conversely, a top naturally larger than that of the stock tends to cause prolific bearing; apples and pears grafted upon dwarfing stocks are good examples.

Oregon-grown ROSEBUSHES

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Grown Right and Packed Right

A card will bring our list of items that will make you some money.

MILTON NURSERY CO.
Milton, Oregon
"Pioneer Nursery of the Northwest"
Fruit, Shade, Flowering and Ornamental Trees, Fruit Tree and Chinese Elm Seedlings. Car lot advantages to all points east.
Send for our Trade List.

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1436 N. E. Second Ave. PORTLAND, ORE.
Largest Fruit Tree Seedling Growers In America.
We accept growing contracts for 2 to 5 years. Quality stock. References on request.
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Fruit, Shade, Flowering Ornamental Trees, Fruit-tree Seedlings, Roses, Etc.
Very complete line of quality stock
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PEONIES FOR CUTTING.

In the bulletin of the American Peony Society, March, 1937, E. R. Honeywell, department of horticulture, Purdue University, La Fayette, Ind., comments on the fact that although there are several hundred peony varieties, only a few seem to respond favorably to commercial cutting and handling. Even these varieties respond differently under different cultural conditions, localities and seasons. Therefore care should be exercised to select only those varieties that have been tested and proved worthy of commercial culture.

His summary of the essential features of a good commercial peony is divided into six parts. 1. It must be a flower of good color and attractive form through all stages of development. 2. A double flower is preferable; desirable fragrance is important. 3. It should bloom freely and without fail year after year. 4. The stems should be stiff, wiry and straight; of uniform length, twenty to thirty-two inches, and the foliage should be low set and of good color and quality. 5. Varieties which produce a single bud or only a few laterals per stem are best; less labor is required for disbudding. 6. The bloom should be a good shipper, tolerant to abuse and responsive to storage and water treatments.

In his experience the varieties which most closely meet these essential qualifications are the following: Albert Crousse, double, large, late, rose-pink with a creamy tone, mildly fragrant, tall, free flowering, good foliage and strong stems; Avalanche, double, large, late midseason, blush white of waxy texture, fragrance not sweet but strong, medium height, fair flowering, good foliage and adequate stems; Baroness Schroeder, double, large, late midseason, pale flesh white, delightful fragrance, tall, good foliage, strong stems; edulis superba, double, medium, early, bright old rose-pink, good fragrance, tall, excellent foliage, wiry stems; Felix Crousse, double, large, late midseason, brilliant crimson of even tone, poor fragrance, medium height, good foliage, weak stems; festiva maxima, double, very large, early, white with crimson flakes, fairly fragrant, tall, foliage large and heavy, stems strong; Fragrans, bomb type, small, late, dark pink with slight silver, pleasant fragrance, medium height, foliage fair, stems slender and wiry, hard to disbud, probably overgrown; Karl Rosenfield, double, large, midseason, bright crimson, not fragrant, tall, good foliage, strong stems, a poor shipper; Sarah Bernhardt, double, very large, late, dark rose-pink, fairly fragrant, medium height, good foliage and strong stems.

Other varieties such as Queen Victoria, Floral Treasure, Mons. Jules Elie, Richard Carvel, Mary Brand, Claire Dubois, Augustin d'Hour and Couronne d'Or have been tried and are commonly recommended for cut flower plantings.

Other varieties recommended for use as cut flowers, although not included in the above list, are Adolphe Rousseau, Alexandre Dumas, Armandine Méchin, David Harum, Duchesse de Nemours, Early June, Fontenelle, Inspecteur Lavergne, James Kelway, La Lorraine, La Perle, Livingstone, Mme. Calot, Mme. de Verneville, Mme. Emile Gallé, Mme. Jules Dessert, Martha Bulloch, Mons. Dupont, Octavie Demay, President Taft, Primevère umbellata rosea and Venus.

PEONIES FOR THE SOUTH.

I have recently returned from a trip through the territory that is considered most south for peony culture. It seems that from fifty to 100 miles north of Memphis, Tenn., peonies will bloom for Mothers' day invariably, which explains why there is much interest in planting peonies in that territory. I have seen peony plantings right next to cotton fields, and my observation is that it may help to have some sort of mulch over the soil between the peonies to keep the ground from getting too hot and dry. Although I have not had any tests south of St. Louis, Mo., or Evansville, Ind., I should think that the varieties which do well there would stand a good chance of doing well farther south.

I should suggest using varieties that open easily, keep well and cause the least trouble in the north. I should recommend for cut flowers in the south the following peonies:

BARONESS SCHROEDER — a delicate flesh-white, opening pure white; this variety lasts well both in the field and in storage.

CLAIRE DUBOIS—a satiny pink; similar to Mons. Jules Elie, but blooms later and the flower is more solid.

ALBERT CROUSSE—a shell-pink with long graceful stem that never fails to produce a fine perfect flower.

FELIX CROUSSE—the standard red cut flower. I do not believe there is as yet a red peony that can compete with Felix Crousse, unless it is among the newest varieties which have not had a thorough test and which would not be available in quantities.

LA LORRAINE—while still somewhat expensive for commercial plantings, this will eventually become the standard white. It is of marvelous form, has remarkable keeping qualities, both in the field and in storage, and has that fine form of flowers that is seldom found in peonies other than those created by Mr. Lemoine.

MARIE CROUSSE—this is almost a salmon pink, especially when opened indoors. It has a long stem and is free-blooming. I think very much of this variety and believe it will become one of the stand-bys in the cut flower trade.

MONS. JULES ELIE—this has always been the one satisfactory pink; it blooms early and has a good stem and a large flower.

REINE HORTENSE—this is another of the good stand-bys used by cut flower growers who have been planting the better varieties.

SOUV. DE LOUIS BIGOT—a beautiful deep rose that does not fade in the sun and has a bud like a rose.

SARAH BERNHARDT—this no doubt will become the largest-selling pink in the market. It is a deep pink, with a graceful stem and flower, and if healthy plants are set out, this variety is extremely free-blooming.

My recommendations are based on many years of dealing with cut flower growers throughout the territories of southern Illinois and Indiana and farther east. Strict care must be taken, especially when planting in the south, that the peony roots are from young stock and are strictly healthy.

A peony is not exactly a southern plant, of course, and unless the plants are of the best quality, they soon weaken, especially after severe cutting for flowers. I have seen several plantings of peonies in southern localities that in my estimation could not possibly produce a crop of quality flowers, because of interplantings of soy beans, which in a season like we are having grow fast and rot off the peony foliage, while the roots are supposed to use all the strength they can gather to make strong eyes for the next year.

N. I. W. Kriek,
Lansing, Mich.

MEXICAN FLY QUARANTINE.

The Secretary of Agriculture has announced a revision of the federal domestic Mexican fruit fly quarantine and regulations, No. 64, effective October 15, 1937. The quarantine and regulations as now devised prohibit the interstate shipment of grapefruit, oranges and all other citrus fruits except lemons and sour limes from the counties of Brooks, Cameron, Hidalgo, Willacy and a portion of Jim Wells county, Tex., unless a federal permit has been issued for their movement. Jim Wells county is the only area added under the new regulations.

Peaches, apples, pears, plums, quinces, apricots, mangoes, sapotas, guavas, mameys, ciruelas and fruit of species of the genus sargentia are prohibited interstate shipment from the regulated area.

The revision also fixes a host-free period from May 1 to August 31, inclusive, of each year, subject to such modifications as to duration and dates of commencement and termination as may be authorized by the chief of the bureau of entomology and plant quarantine. It designates the insect formerly known as Mexican fruit worm under

APPLE TREES

We offer to the trade an extra-fine lot of 1-year Apple Trees; all grown from Whole Root Grafts. A complete list to select from. This stock is unusually vigorous and strong. Your customers will like these trees.

Send us your list of requirements for special fall booking prices.

E. W. Townsend Sons Nurseries
Wholesale Dept.
Salisbury, Maryland

Taxus media Hatfieldii
XX, bushy, 8 to 12 ins., 25c
XX, bushy, 12 to 18 ins., 35c
Clethra alnifolia, transplanted
Bushy, 18 to 24 ins., 15c
Viburnum Opulus, 12 to 18 ins., 5c
Viburnum dentatum, 18 to 24 ins., 5c

VAN DER VOET NURSERIES
Taunton, Mass.

If you have not received a copy

WRITE
for our
WHOLESALE TRADE LIST
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BROAD-LEAVED and CONIFEROUS
Lining-out and Balled Stock
Rooted Cuttings

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20,000 **ELMS, American, Vase, Moline,** up to 4 inches, transplanted.

4,000 **MAPLE, Norway,** up to 2½ inches, transplanted.

2,000 **WILLOW, Thurlow,** 8 to 10 ft. and 10 to 12 ft.

10,000 **SPIRÆA, Vanhouttei,** 3 to 4 ft. and 4 to 5 ft.

Send for list on many other items.

C. M. HOBBS & SONS, Inc.
Bridgeport, Indiana
Largest Nursery in Indiana. Established 1875.

1887 *1937*

OUR GOLDEN ANNIVERSARY

We offer for Fall 1937 and Spring 1938 our usual line of
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FOREST AND SHADE TREES
VINES AND CREEPERS
NATIVE PLANTS
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And Complete Line of Nursery Stock
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Hardy Minnesota-grown Nursery Stock and Liners
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HILL'S EVERGREENS
Complete assortment of lining-out sizes
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Canterbury Boxwood
Buxus suffruticosa and B. sempervirens.
Selected uniform plants; bushy and foliaged to center; masses of fibrous roots. Finished specimens from 4 inches up, ready for quick shipment. Prices lower, plants larger. Ask for special list.
CANTERBURY, Box A, Easton, Md.

the more appropriate title of Mexican fruit fly, adds fruits of species of the genus sargentia to the list of hosts, modifies former specific restrictions as to containers and provides that the chief of the bureau of entomology and plant quarantine may specify the conditions and period for the maintenance of sanitary requirements in groves, and may modify, by administrative instructions, any of the restrictions contained in the regulations, other than those pertaining to extension or reduction of the regulated area, when in his judgment such action is necessary to prevent the spread of the Mexican fruit fly.

ROSE REGISTRATIONS.

The American Rose Society's registration committee has approved applications for registration of the following roses. Notice of these registrations has been sent to rose organizations in foreign countries and trade papers.

If no objections are raised before December 7, 1937, the registration of these names will become permanent as of that date.

Audrey Stell. Hybrid tea. Discovered by L. H. Stell, Tyler, Tex., and said to be a sport of Soeur Therese with Talisman-like flowers of soft, strawberry-pink inside and sulphur-yellow on the reverses. The plant is described as vigorous, disease-resistant and a continuous bloomer from May to November in Texas.

Jean Bostick. Hybrid tea. Discovered by J. A. Bostick, Tyler, Tex., and said to be a sport of Condesa de Sastago. The flower is described as similar to its parent except that the color is deep yellow, with occasional red splotches on the reverses and outer edges of the petals, and it does not fade. Plant and blooming habit are like its parent.

Eddies' Advent. Hybrid tea. Originated by H. M. Eddie, Sardis, B. C., Canada, as a cross of Mrs. Sam McGredy and Edith Krause. Flower is described as large, high-centered, double, blooming singly on a medium stem and having slight fragrance. The color is pale buff shaded almost to white, with petals tipped pink; inside of petals is pale buff. Plant is described as upright to three feet, with an open habit and normal green leathery foliage, blooming moderately continuously during the season.

Friendship. Hybrid tea. Originated by Albert F. Amling Co., Maywood, Ill., and said to be a cross of Templar and Talisman. Flower is described as dark red, of medium size, high-centered, with good lasting quality. It is semi-double and blooms singly on a medium-length stem. Plant is described as vigorous, disease-resistant, and blooms abundantly continuously during the season.

Dark Secret. Hybrid tea. Originated by Albert F. Amling Co., Maywood, Ill., and said to be a seedling of Radiance and Hollywood, with a dark red flower almost black in cool weather. Bloom is described as large, globular, very double and with strong fragrance. Borne singly on short stems. Plant is described as of moderate growth, of dwarf habit and blooming profusely.

Good Cheer. Hybrid tea. Originated by Albert F. Amling Co., Maywood, Ill., and said to be a seedling of Talisman and Templar. Flower is cerise in color, of medium size, open form, moderate fragrance, double, blooming singly on long stems. Plant is described as upright, disease-resistant, and is said to be a profuse, continuous bloomer during the season.

Good Morning. Hybrid tea. Discovered by Ruth Kaucher, Newtown, Pa., and said to be a sport of Premier Supreme with a white flower bearing faint pink on reverse of petals. Very large with very good lasting qualities and moderate fragrance. Flowers are very double and bloom singly on long stems. Plant is described as very vigorous, with few thorns, leathery foliage, and a profuse, continuous bloomer during the season.

Virginia Dare. Hybrid tea. Originated by J. H. Thompson's Sons, Kennett Square, Pa. Said to be a seedling of Joanna Hill x (Templar x Gunston Hall). Flowers described to be of Briarcliff type, deep cerise pink in color, of large size, full, good lasting quality, and strong old rose fragrance. They are borne singly on long stems. Plant is described as very vigorous with dark green, medium-size foliage and ordinary thorns, furnishing abundant bloom continuously during the season.

Climbing Better Times. Climbing hybrid tea. Discovered by Parmentier's Roses, Bayport, N. Y. Said to be a sport of Better Times with a flower exactly like its parent, except that it is larger and that, in addition to its climbing habit, it throws strong breaks which do not climb, but which are much stronger than Better Times itself and produce better flowers. Plant is described as vigorous and as blooming abundantly from June to October. Plants outdoors had their tips frozen slightly last winter.

R. Marion Hatton, Sec'y.

TAXUS CUSPIDATA CAPITATA

(Upright Japanese Yew)

Our knowledge of the manifest qualities of this evergreen prompts us to transmit a share of the high regard we hold for it. Decidedly the best "all purpose" evergreen in our huge nursery, it ranks as "America's Public Evergreen No. 1."

An interesting deep green, holding good color throughout the entire year; contrasts beautifully in arrangement with other evergreens; dignified and lovely as a specimen; excellent in foundation planting; hardy; not particular as to location; dense, compact and practical as a hedge; adaptable to any desired shearing.

The fibrous roots of our Taxus are a result of frequent root pruning, insuring a hundred per cent earth ball, with almost perfect transplanting success. Sizes for all planting conditions. Quotations on request.

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SUPERIOR
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Write for Trade List
EVERGREEN NURSERY CO.
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Splendid Stock
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Trade Meetings

NORTH JERSEY MEETING.

A regular meeting of the North Jersey Metropolitan Nurserymen's Association was held October 14 at the Passaic county courthouse annex, Paterson, N. J.

Considerable discussion was had on ways and means of building up the present fund that the members have, in order to enlarge the combined buying power of the association for its members.

C. Hess reported some difficulties his committee was having in arranging a winter course for nurserymen through the state college this winter.

The planting committee reported on the completion of the lawn job done by members at the county courthouse.

A. Wolsky was voted a member of the association.

The annual ladies' night was set for November 16, to be held at the Robin Hood Inn, Valley road, Clifton, N. J. This is an annual affair held each year to enable members' wives to get together.

Harry Deverman took orders from the members for leather binders to be sent to clients to file the monthly issues of Garden Craft sent out by members of the association.

William Halliey, Sec'y.

CALIFORNIA MEETINGS.

The Southern California Horticultural Institute held an exceptionally interesting meeting at the Mayfair hotel, October 21. The capable secretary, Lou Johnson, had promised that by way of entertainment the group was not going to be outdone by the picture shows, and he made good his promise. William (Destruxol) Johnson exhibited his unrivaled collection of native and imported bugs, in thirty-five glass-topped boxes, with leaves and other materials on which the particular bug specializes, showing just what they do to damage or destroy. His presentation of the subject was well given and graphically demonstrated. The Technicolor preview of the Pasadena flower show, which is being held in Carmelita Gardens, October 29 to 31, was presented by Mrs. C. R. Kayser, projectionist and commentator. Kodacrome motion pictures of "Chemiculture," by R. F. Heron, San Pedro, were timely and informative, showing the latest developments in growing plants without soil. Mr. Heron is an executive of the Plant Culture League and co-author of "Scientific Plant Farming." The institute sponsors an interesting radio program over KECA Sunday mornings at 9 o'clock, called the "Garden Club of the Air."

Barberries and related material were discussed at the meeting of the California Horticultural Society at California hall October 18 by Robert H. Menzies, San Rafael. He has made a hobby of barberries, receiving seeds from the east after the late Ernest H. Wilson's trip to China. Some of his specimens are thirty feet high. According to Mr. Menzies, barberries require no special irrigation, their growth is rapid for the first five years, when they seem to make most of their growth, and they bloom longer than crataegus. The color is fine and does not require extreme cold to bring it out. Among his favorites are pruinosa, Bergmanniæ, acanthophylla and Nevenii. Cuttings are made in the fall months, although the plants grow readily from seeds. Several varieties were on display, including Thunbergii, Wisley, from Sydney B. Mitchell's gardens, and Wilsonæ.

BEAUMONT CLUB MEETS.

The Beaumont Florists' and Nurserymen's Club will hold another flower show this fall as a feature of the south Texas state fair, November 4 to 15 at Beaumont. An attractive roomy space has been assigned the florists. In the past, exhibits have been generally limited to amateurs, but last year several members of the club staged small displays on the invitation of the management, for trial, and this year the florists have been invited to stage a coöperative show, with six cut flower booths and six or seven displays in the nursery, pot plant and landscape sections. Those who will have cut flower exhibits are: Avenue Floral Co., Davis Flower & Gift Shop, Johnson's Florists, Murchison Florists, Philip Newman and Park Flower Shop. Plantsmen, nurserymen and landscape men who will participate are: Mrs. Bettersworth, Griffing Nurseries, Philip Newman, A. C. P. Tyler, L. A. Williams and P. A. Winkler.

SHOW AT NEWARK, N. J.

Small home landscaping and interior decoration with flowers were demonstrated in the garden show held at Newark, N. J., during the week ended October 16 at the "House Practical" of the Public Service Electric & Gas Co., under sponsorship of the New Jersey Nurserymen's Association coöperating with local garden clubs.

Members of the New Jersey Nurserymen's Association did the landscaping of the front lawn, which featured the use of taller evergreens near the entrance gate to give seclusion, with borders of broad-leaved evergreens below low shrubs in autumn colorings interspersed with deciduous trees used in borders at the sides and near the front of the Georgian house. The rear lawn of terrace type for outdoor living had a low chrysanthemum border beside the house flanked by graduated evergreens.

Other landscaping features contributed by the nurserymen included two lily pools by William L. Tricker, Saddle River, N. J. He also exhibited three small aquariums set like shadow boxes in a panel. Charles H. Totty, Madison, N. J., had the largest of the cut flower exhibits in the auditorium. The display, which was freshened during the week by chrysanthemums, included large-flowering single and orchid-flowering dahlias. Of special interest was a new single variety of early chrysanthemum, Athalia, buff-colored with red tints. Roses in the exhibit included Queen Mary, introduced last spring. Another new flower was the Esther Reed Shasta daisy, imported from England.

Thomas Young Nurseries, Inc., Bound Brook, N. J., had an orchid exhibit arranged by F. A. Kuehn, local florist. It was mostly of cattleyas. Other flower booths showed exhibits of chrysanthemums, bulbs and snapdragons, by Paul F. Rochelle, Morristown; chrysanthemums, roses and terrariums by L. A. Noe & Son, Madison, and dahlias and chrysanthemums by S. S. Vorhees & Sons, Maplewood. Stumpp & Walter Co. exhibited garden equipment, and Ethelburt Furlong, landscape architect, had a display of garden pictures and designs.

ELECTION of officers of the Central California Nurserymen's Association, held at the annual meeting in San Francisco October 21, resulted as follows: President, Toichi Domoto, Hayward; vice-president, Richard Plath, San Francisco, and secretary-treasurer, W. B. Tuttle, Jr., San Jose. A large number attended the dinner.

BARBERRY THUNBERGII SEEDLINGS

1-year

6000, 3 to 6 ins. 8000, 6 to 9 ins.

25,000 **Ampelopsis Veitchii,** 1-year seedlings

2,000 **Ampelopsis Veitchii,** 2-year transplants

Asparagus, Pedigreed Washington, 2-year

Hydrangea Pee Gee, 3 to 4 ft. and 4 to 5 ft.

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Maple Bend Nurseries Perry, Ohio

LINERS, extra nice

Berberis, Calycanthus, Cornus, Crataegus Cordata, Fraxinus, Malus Coronaria, Chinese Elm, Multiflora Rose Stock, the nicest block of Multiflora in the country. How many do you want and what size? A good many other items in quantity. Send for bargain list, now.

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COLORADO BLUE SPRUCE SEED

from bluest trees.

Also complete line of Evergreen and Deciduous tree seeds from all over the world.

Ask for price list.

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SMALL FRUIT PLANTS

Leading varieties of Grapes, Asparagus, Rhubarb, Currants, Berry Plants.

Fall price list now ready.

Krieger's Wholesale Nursery

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HARDY AZALEAS

Kaempferi, Poukhanensis, Schlippenbachii, Mucronulata, Vaseyi, Calendulacea.

Enkianthus, Juniperus Rigida, Hick's Yew, Ilex Bullata, Photinia, Honey Locust, specimen Mughos, Austrian and Limber Pines.

Fine variety of high-grade Nursery Stock.

Large Yews, 12 to 15-ft. spread.

Write for prices.

BRIMFIELD GARDEN NURSERY

245 Brimfield St. Wethersfield, Conn.

PEACH TREES

Thrifty June-budded Stock

We offer to the trade an up-to-date list of the leading varieties to select from. All of these trees are grown on our farms in Maryland. They have shaped up nicely and have a well balanced fibrous root system—the kind of stock that will please you and your customers.

We invite your inquiry and offer special prices on early fall bookings.

E. W. Townsend Sons Nurseries

Wholesale Dept.

Salisbury, Maryland

PEACH TREES

Peach Seed

Pin Oak **Ilex Crenata**

General Line Quality Ornamentals

HOWARD-HICKORY CO.

Hickory, N. C.

Peach Seed and Peach Trees

Write for prices. Large acreage of nursery stock. Will appreciate your want list.

SOUTHERN NURSERY CO.

Winchester, Tenn.

PEACH PITS

Our Pits Compare Favorably With the Best

HOGANSVILLE NURSERIES

HOGANSVILLE, GEORGIA

Magnolia Grandiflora Seed

From this year's crop (not cleaned), **$1.00** per lb. **NANDINA** seed (berries), fresh crop, **$1.00** per lb. **CHERRY LAUREL** seed (berries), fresh crop, **25c** per lb.

Fruitland Nurseries **Augusta, Ga.**

We offer First Quality tested seeds of

COLORADO EVERGREENS

and Native Shrubs, Perennials and Alpines

Write for list

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Colorado Springs Colorado

LANDSCAPE HOUSING PROJECT.

Though the New York city housing authority does not allow any grass to grow under its feet, there were approximately one-quarter million square feet of bright green lawns to greet the first forty-five families who September 29 took possession of their new apartments in the Williamsburg housing project. The Outpost Nurseries, Ridgefield, Conn., to which the $50,000 contract for landscaping the Williamsburg apartment grounds was awarded, had a year in which to provide natural beauty around the functional Williamsburg buildings. But they have broken all records for landscaping speed and expect to have finished the job in no more than forty-eight working days. Already over 250 of the 500 shade trees which will be planted are in their places, and bright green foliage is in evidence all around the first six units of the project, which are now ready for occupancy.

The landscaping on the Williamsburg project was begun during the third week of September, and a staff of seventy-five has been employed on the job. In addition to the 500 shade trees, 6,000 flowering shrubs are being planted.

Seven thousand yards of Connecticut topsoil were brought from Outpost's Ridgefield nurseries, and arsenate of lead is being used as a repellent of grubs and beetles. Seventeen thousand lineal feet of wire are being used for the guying of the trees.

Other municipal projects on which the Outpost Nurseries are at present engaged in landscaping work include the new Riverside drive parkway and the world's fair grounds in Flushing. They recently completed the transplanting of 200 flowering crab apple trees in the new Central park conservatory gardens.

HEMLOCKS AT AUCTION.

The sale of hemlocks conducted by the Royal Oak Boxwood Farm, Marion, Va., October 21, proved to be successful. Owing to high waters and bad weather conditions, the attendance was not so large as expected.

All stock sold brought a satisfactory price. More than 8,000 pieces were sold, including those delivered to late arrivals after the sale was closed and the next morning. Bidding was spirited, and those who attended commended the quality of the hemlocks. When the nurserymen present had purchased their requirements, it was unanimously agreed to extend the sale until sometime in March, when the remainder will be disposed of at another auction.

BULLETINS RECEIVED.

"Chilling Requirements for Opening of Buds on Deciduous Orchard Trees and Some Other Plants in California," issued as bulletin 611, July, 1937, by the University of California, Berkeley, is the work of five members of the university staff and presents the observations of fourteen years as to the effects of varying amounts of winter chilling on the blossoming and the beginning of growth of deciduous plants in different sections of the state. Great differences were noted among deciduous species as to the amount of chilling required for satisfactory opening of the buds in spring.

VASE ELM

		Per 100	Per 1000
500	1¾ to 2 -in. ...	$125.00	$1100.00
2000	2 to 2½-in. ...	175.00	1500.00
1200	2½ to 3 -in. ...	200.00	1750.00
500	3 to 3½-in. ...	275.00	.....

MOLINE ELM

200	1¾ to 2 -in. ...	125.00	.....
500	2 to 2½-in. ...	175.00	.....
500	2½ to 3 -in. ...	200.00	.....
500	3 to 3½-in. ...	275.00	.....

SCHWEDLER MAPLE

800	2½ to 2¾-in. ...	275.00	.....
250	3 to 3½-in. ...	350.00	.....

AMERICAN ELM

5 to 10-in. diameter. Prices on application.

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Shermer Rd. **Northbrook, Ill.**

SPECIAL 30 DAY SALE

of Lining-out and Specimen Stock

Hardy and Rare Trees, Shrubs, Ferns, Vines and Herbaceous Perennials of the Blue Ridge Mountains.

Write for price list.

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Ashford, McDowell Co., N. Car.

FALL PLANTING SPECIALS

$1.00 Specials. Each Item $1.00

10 **Bleeding Hearts,** 20 beautiful **Blackmore & Langdon Delphinium** seedlings, from imported stock; 20 double hybrid **Painted Daisy** seedlings; 20 **Tenuifolium Lilies;** 10 **Boxwood;** 20 different **Irises,** labeled; 4 **Mead's hybrid Amaryllis;** 100 mixed **Gladiolus** bulbs; 20 **Parma Violets;** 20 **Confederate Violets.**

Bleeding Hearts, 3 to 5-eye, whole crown. **$7.50** per 100.

200 **Irises,** all different, labeled, **$10.00.**

SMITH GARDENS, **Clarkston, Wash.**

SMALL FRUIT PLANTS

Evergreens — Shrubs

Lining-out Stock

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That's what several subscribers have said about the 6-page table on **Seed Stratification Practices** in The American Nurseryman.

So many requests for extra copies have come that the four articles by L. C. Chadwick on

Improved Practices in Propagation by Seed

have been reprinted in booklet form, at **25 cents per copy.**

Send your order now.

Valuable articles of this type constantly appear in The American Nurseryman. Every grower of, and dealer in, outdoor stock should read it regularly.

One prominent nurseryman said recently: "When I clip the informative items from your magazine for my files, there isn't much left."

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Experienced greenhouse and nursery man. Am planning to build commercial type greenhouse for propagating wild azaleas, blueberries, wild flowers and small fruits, largely for stocking own place. Location four miles from small town in south. Applicant would also be required to be in charge of planting around home and artificial lake. Suitable small house will be built with lights, water and sewerage. Preferable, but not necessary, applicant also be in charge of care of four saddle horses.

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HELP WANTED

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FOR SALE

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In practically new condition, has been used very little; identical with 4-foot ball capacity cart shown on back cover page September 15 issue of this paper. As we have need for a larger outfit, will sacrifice this machine for cash or nursery stock.

S. J. Cook Nursery, Dunkirk, N. Y.

TYLER ROSE FESTIVAL.

The state of Texas has been made conscious of its rose-growing industry to a marked degree in the past five years by the annual festival and rose show of the East Texas Rose Growers' Association, which was held at Tyler, October 8 to 10. The current event surpassed its predecessors and attracted an attendance of approximately 75,000 persons, with a few from outside the state.

The opening affair was a luncheon given by the East Texas Rose Growers' Association and the Tyler chamber of commerce at the Blackstone hotel, while a garden club luncheon was in progress at the Woman's building. The queen of the festival was Miss Katherine Booty, daughter of Mr. and Mrs. Gus Booty, Tyler, and her coronation was a spectacular event. It was followed by the queen's ball at the Willowbrook Country Club. The climax of the second day was a parade, in which appeared twenty high school bands from other cities, the Texas A. & M. College band and groups from various civic and fraternal organizations.

The rose show, held in the gymnasium of the Tyler high school, displayed tables of vases containing competitive entries, while along the walls were about 100 varieties of roses shown in shadow boxes. A rose garden was built on the adjacent roof, seen through the gymnasium windows, by Maurice Shamburger, Tyler landscape artist. Another garden was constructed by the Lambert Landscape Co., Shreveport, La., in the center of the main gymnasium.

Competition was of vases of some newer varieties of roses and also in color classes, as well as florists' arrangements. Prize-winners in the commercial division were Southland Rose Nurseries, Henderson's Nursery, Rose Hill Farm, McGinney Rose Nursery, Atwood Rose Nursery, Mrs. Ira L. Moore, Arp Nursery, Stell Rose Nursery, P. C. Moore, M. S. Shamburger, Vermay Nursery, Carl Shamburger Nursery, Dixie Rose Nursery, Mrs. John L. Campbell and Judge the Florist.

The committee in charge of the show consisted of Dr. J. C. Ratsek, assisted by A. F. Watkins, Carl Shamburger, Bryan McGinney, Tom Ramey, Mrs. Henry Eagle, Mrs. J. H. Cox, Allen Bostick and John Womble, manager.

TEXAS FREIGHT RATE.

Texas nurserymen are making application for the extension of the special rate, effective in Texas on column 20, 30,000 pounds minimum, balled and burlapped nursery stock, and it is hoped that the present rate may be made permanent. The question of extension of the expiration date was discussed at the October meeting of the Texas-Louisiana freight bureau, but definite action was postponed until the November meeting. The Texas Association of Nurserymen and leading nurseries of the state are expected to press the matter at the hearing November 2.

A proposal has just been docketed by the Texas-Louisiana freight bureau to establish column 34½ for application on nursery stock between points in Louisiana. The basis for this proposal for application intrastate in Louisiana is that the basis is now in effect between points in the southwest and also between southwestern points and other territories.

ELM DISEASE FIGHT IN MOVIES.

The fight against the Dutch elm disease is one of the subjects of a current March of Time film. Shown are a corps of workers in the laboratories of the bureau of entomology, of the United States Department of Agriculture, Washington, D. C., examining suspected elm twigs for the elm bark beetle responsible for the disease, and also crews of men taking down diseased trees and burning them. In addition to the department's regular workers, numbers of C. C. C. boys are pictured aiding in this work.

Filmed in his Washington office was Dr. Lee A. Strong, head of the bureau of entomology, consulting with a subordinate on a Mexican white-fringed beetle that appeared on southern farms this past season, threatening all crops. The sequence shows the method of trenching to trap the pests as they migrate from an infested field to one not yet infested and then the destruction of the trapped insects by spraying with insecticides.

To justify the enormous expenditures of the bureau in combating such pests, Dr. Strong announces that for each dollar spent in the war on insects, $10 are saved.

BUSINESS RECORDS.

Seattle, Wash.—Earl C. Scott, receiver of Malmo & Co., has announced the offer for sale of the assets of the corporation under receivership. These include the tracts at East Marginal way and Ellis avenue with the buildings and nursery stock thereon, nineteen acres on Ellis avenue between Elizabeth and Myrtle streets with buildings and stock thereon, and the supplies and equipment on hand. Bids were received by 9:30 a. m. October 29, at which time they were opened in court under the direction of Judge Hugh C. Todd, of the Superior court.

AT THE formal opening of the Talbott-McWhinney Nursery, 1525 American avenue, Long Beach, Cal., a soil analyst was on hand to analyze any samples submitted and an illumination engineer demonstrated garden lighting equipment.

CLASSIFIED ADVERTISING

Peonies: Tree and Herbaceous, best varieties. **Oberlin Peony Gardens, Sinking Springs, Pa.**

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We will have approximately fifty thousand Azalea liners for February-March delivery. Place your order now.
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Tennessee Nursery Co., Box 1, Cleveland, Tenn.

Hardy Privet Amoor North, 1-year, 6 to 9 ins., $1.50 per 100, $12.50 per 1000; 9 to 12 ins., $2.00 per 100, $15.00 per 1000; 12 to 18 ins., $2.50 per 100, $20.00 per 1000; rooted cuttings, $6.00 per 1000. Packed free.
Wm. Mandel, Nurseryman, Bloomington, Ill.

Hardy Chrysanthemums, Pink Cushion, strong field plants, $10.00 per 100. Red Cushion, White Cushion, Bronze Cushion, strong 2¼-in. pots, $8.00 per 100. Order at once. Stock limited. Not less than 25 of a variety, not less than 50 plants to an order. Stock unconditionally guaranteed.
Wonderland Nurseries, Ellerson, Va.

CATALOGUES RECEIVED.

[In writing for a copy of any of the catalogues reviewed below, please mention that you saw it described in The American Nurseryman.]

Sherwood Nursery Co., Portland, Ore.—Wholesale trade list of forty pages of nursery stock, including conifers and broad-leaved evergreens, deciduous shrubs and rock plants. Particularly mentioned are Teucrium chamædrys, a ground cover; Darley heath, and evergreen huckleberry.

Verhalen Nursery Co., Scottsville, Tex.—Wholesale price list, illustrated with half-tones, of evergreens, chiefly, with some deciduous material, including patented roses. There is an index.

Van Veen Nursery, Portland, Ore.—Four colored pictures brighten the 8-page booklet, "Catalogue No. 16," of rhododendrons and azaleas. Varieties are named and there are cultural notes.

Jewell Nursery Co., Lake City, Minn.—Dated October 16, comes a price list of four mimeographed foolscap sheets. Tree seedlings and liners, shrub liners, flowering shrubs, evergreens, ornamental and fruit trees, also some perennials, are included. There are potted evergreen liners.

Barnes Bros. Nursery Co., Yalesville, Conn.—Fall wholesale price list of evergreen trees and shrubs, deciduous trees and shrubs, vines, climbing roses, peach trees, grapevines and perennial plants. There are thirty-four pages and an index.

Andorra Nurseries, Inc., Philadelphia.—Evergreen and deciduous material, both trees and shrubs; vines, roses and perennials, including hardy chrysanthemums, peonies and phloxes in a number of named varieties; irises, ferns and fertilizers are all enumerated in the 128 pages of a well printed catalogue. There are many half-tones, with several colored illustrations. Both the botanical and common names are given, the authority being Standardized Plant Names. Rhododendrons are offered in variety, one of the color plates being of Andorra's own-root rhododendrons. There is an index.

Baker Bros. Nursery, Fort Worth, Tex.—Wholesale price list of nursery stock—evergreen and deciduous. A number of varieties are offered in lining-out sizes. Special attention is called to several novelties and items specially recommended for their hardiness.

Boyd Nursery Co., McMinnville, Tenn.—Price list for the trade of fruit trees, forest and shade trees, hardy ornamental shrubs and hedge plants, evergreens, vines, forest tree seedlings and lining-out stock. Miscellaneous items cover hardy collected native ferns, bulbs, hardwood cuttings, peach pits and tree and shrub seeds. An index appears on the back page. Mention is made of a good growing season.

Shenandoah Nurseries, Shenandoah, Ia.—Lake's fall wholesale list, dated October 1, a 68-page catalogue of nursery stock and supplies. The extensive listings cover fruit items, ornamental and shade trees, vines, evergreens, perennials and bulbs. Included are many patented items and novelties. A view of the firm's 250-carload capacity storage quarters appears on one page.

A. E. Wohlert, Narberth, Pa.—"Oriental Wisteria for the American Garden," a splendidly prepared booklet describing the varieties, culture and uses of wisterias. Eight of the sixteen pages are given to illustrations showing remarkable wisteria plantings.

Forest Nursery Co., McMinnville, Tenn.—Wholesale price list No. 1 for fall, 1937, marking the firm's fiftieth anniversary. The first section lists nursery-grown material while the latter contains offers of collected stock. There are hardwood cuttings, American-grown fruit tree seedlings, collected native vines and tree seeds besides the usual nursery items.

Howard & Smith, Montebello, Cal.—"What and When to Plant," a special illustrated bulletin describing the firm's seasonable offerings of novelties and standard selections of seeds, bulbs and plants. The publication also contains timely planting suggestions and liberal cultural notes and other instructive material. The cover illustration gives a fine display to H. & S. Ranunculus Giants of Montebello.

Buntings' Nurseries, Inc., Selbyville, Del.—Included in this wholesale price list, illustrated, are fruit trees, strawberry plants, shrubs, vines, hedge plants, roses, cannas, shade trees, evergreens, broad-leaved evergreens and lining-out stock—in that order.

N. A. Hallauer, Webster, N. Y.—Field-grown perennials, hardy lilies, irises, peonies and a few shrubs and vines are offered in a folder giving fall wholesale prices.

Ignaz Seckl, Wiener-Neustadt, Austria.—Price list, printed in English, with American currency, of tree seeds—evergreen, deciduous and fruit.

Home Garden Co., Lysander, N. Y.—Two alphabetized folders—one of peonies, the other of irises, the latter illustrated with a photograph of an iris planting around a pool. In each folder named collections are listed. There is also a mimeographed list of irises, with special October prices.

Bolen Florist & Camellia Gardens, Lucedale, Miss.—Illustrated folder of named camellias, with some palms, magnolias and live oaks.

The Homestead Nurseries, Boskoop, Holland.—Mimeographed catalogue for 1937-1938 of azaleas, hydrangeas, roses, Phlox decussata and trollius hybrids.

AUXILIN

THE MIRACLE ROOT GROWER NOW AVAILABLE!

WHAT IS AUXILIN?
HOW is Auxilin used?

Auxilin—the miracle root grower—is a hetero-auxin, with its active ingredient—*Indolebutyric acid*—that actually induces strong, healthy roots to grow on cuttings from plants, shrubs and trees.

Auxilin comes packaged in liquid form for water dilution. No special equipment or experience needed. Simply follow directions using graduated phial furnished. Get results (as shown above in actual photograph of Camellia—rooted in 6 weeks when Auxilin treated) with hard-to-root and heretofore impossible-to-root cuttings.

PROFESSIONAL GROWERS: Special trade discounts on quantities of 3½ oz. or more. Auxilin is also available as Indolebutyric acid in crystalline form.

NOTE

⅛ oz. . 50c	½ oz. $1.00	3½ oz. $6.00	8 oz. $12.00
will treat up to 600 cuttings.	will treat up to 1,800 cuttings.	will treat up to 12,000 cuttings.	will treat up to 30,000 cuttings.

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CHEMICALS LIMITED
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A Guide to Plant Propagation, Culture and Handling

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From their own experience in commercial nursery practice, from results of experiment and research, and from their wide acquaintance with modern nursery methods, Professors Laurie and Chadwick have written this complete manual covering every branch of nursery practice.

The book provides complete reference for everyone concerned with the propagation of plants, giving full descriptions of all methods and many tables which indicate at a glance the treatment to give any particular plant. It also discusses fully and completely tools, tillage, planting, transplanting, digging, grading, labeling, pest control, soils, fertilizers, storage, advertising, selling, and every other phase of nursery management.

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110 illustrations. 70 tables, 552 pages, waterproof fabrikoid binding.

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Sept. 24, 1937

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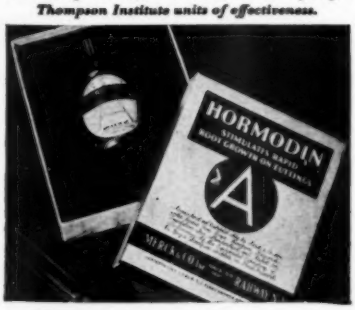

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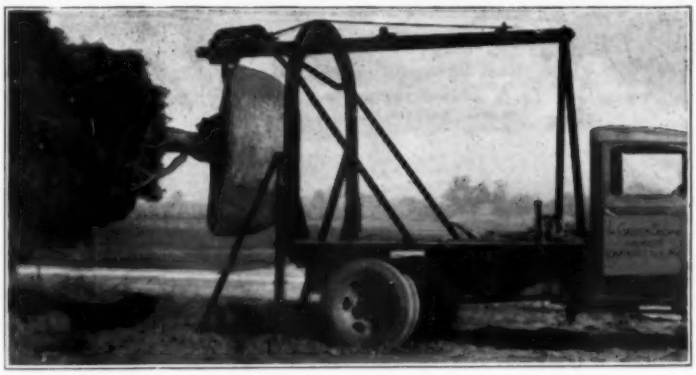

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TEST it for yourself. Compare results with what you have been getting from your present sprayer. Use any spray solution or cold water paint. Spray your nursery stock, whitewash your greenhouses, barns and tool sheds, **inside and out.** Note how easily this **Paragon** delivers powerful uniform pressure at the nozzle with little effort at the pump handle. Passes through narrowest aisles without jamming at corners. Automatic agitator prevents solution from settling. We guarantee it **never to clog** while in use. Ten days trial costs you nothing if not satisfied. If your dealer does not sell the Paragon, **mail the coupon today.**

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CALIFORNIA SPRAY-CHEMICAL CORPORATION
Elizabeth, New Jersey Richmond, California

Nursery VOLCK

Patent No. 2073695

CLOVERSET POTS

MADE OF HEAVIER STOCK THAN LAST YEAR

Help You Grow Better Stock
Help You Make More Profit
Bring Your Business Up to Date

For Roses, Perennials, Chrysanthemums, Shrubs, Vines and Fruit Trees

CLOVERSET POTS ARE MADE OF ASPHALT IMPREGNATED FIBER STOCK

They are durable They are durable enough to permit growing your plants in them the entire growing season.

They are light They are light enough (they weigh only 1/20 as much as a clay pot of equal soil capacity) to be easily handled.

They do not dry out They are non-porous, which means they will not dry out quickly on hot or windy days, and therefore do not require constant watering as does a clay pot.

They make the plant look larger and better They are so finished in appearance that they add to the attractiveness of the plant grown in them.

Large soil capacity They are large enough to comfortably accommodate the roots in a natural position of any No. 1 Rose Plant and all the most salable size shrubs and small trees.

They are cheap in price They are so cheap that they can be given away with the plant which insures the safe arrival, in first-class condition, of the plant grown in them, to its final destination.

They make the nursery business an all summer business They permit the nurseryman to extend his selling season from early spring through the summer and fall, and to plant Roses and other nursery stock grown in them even in the hottest summer weather, without the least sign of wilt of either the foliage or the blooms.

You can sell your plants in bloom By growing your stock in our pots you may sell it in full foliage and in **Full Bloom**, when it will command the best price, and most profits.

They eliminate cut-rate competition The use of our Cloverset Pots will enable you to eliminate the competition of the cut-rate drug and department stores, who cannot sell nursery stock in these big pots on account of the excessive weight and the expense of handling.

Send us a sample order Give them a trial and you will always use them.

Send us your order with your remittance, $13.50 for 300 pots, 100 each of 3 sizes, or send for full information about sizes, prices and testimonials from users of our pots.

Carton of samples, by mail for 25c to pay postage

CLOVERSET FLOWER FARM, 105th Street and Broadway **Kansas City, Mo.**

If it's burlap we have it

J. SHORE & COMPANY

Largest manufacturers and importers of Burlap and Rope

73-75 Auburn St.
CHELSEA, MASS.

SEEDS

FOR IMMEDIATE DELIVERY	¼ lb.	lb.
Prunus americana, American Plum	$0.50	$1.65
" avium, Mazzard	.25	.80
" Besseyi, Bessey Cherry	.75	2.50
" cerasifera, Myrobalan Plum	...	.60
" incisa, Mame Cherry	.65	2.25
" Mahaleb, Mahaleb Cherry	...	.75
" maritima, Beach Plum	.40	1.25
" nigra, Canada Plum	.60	1.90
" pennsylvanica, Pin Cherry	.55	1.80
" serotina, Black Cherry	.30	.90
" serrulata, Oriental Cherry	.45	1.50
" yedoensis, Yoshino Cherry	.65	2.25
FOR SPRING DELIVERY		
Malus sylvestris, French Crab Apple	.35	1.10
Pyrus communis, French Pear	.75	2.50
" serotina, Japanese Wild Pear	...	2.30
" ussuriensis, cultivated	...	2.75

Special prices in large quantities. Terms: Less 5 per cent for cash with order. When remitting add for packing and postage.

25c for a reprint of Dr. L. C. Chadwick's "Improved Practices in Propagation by Seed."

Free catalogue of full list of general Tree and Shrub Seeds upon request.

HERBST BROTHERS, 92 Warren St., New York, N.Y.

LABELS FOR NURSERYMEN

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